ARCHIVES OF OPHTHALMOLOGY.

A PLEA FOR THE MORE GENERAL USE OF THE MICROSCOPE IN DIAGNOSIS BY OPHTHALMOLOGISTS.

By A. B. KIBBE, M.D., Seattle, Washington.

THE disastrous consequences of gonorrhœal infection of the conjunctiva when unrecognized in its early stage and when treated as a simple conjunctival catarrh are familiar to every ophthalmologist. Such a case coming from the hands of the general practitioner is generally held to indicate either carelessness or ignorance on his part, and rightly so if the patient has been continuously under observation, but it is frequently the case that the patient was seen but once or twice at the outset of the disease, and received a mild astringent wash for what was looked upon as a simple acute conjunctivitis. Were all cases of gonorrhœal ophthalmia accompanied at their beginning by the classical symptoms of brawny swelling of the lids, with profuse discharge, error in diagnosis would be inexcusable, but it is an unfortunate fact that just as the parent disease in the male may for several days be an extremely mild affair, so may the conjunctival inflammation in its incipiency show itself by slight injection with watery or muco-purulent secretion and trivial swelling of the lids. Under these circumstances to say with certainty from mere ocular inspection that the disease is or is not gonorrhœal is impossible. Here there is but one way to decide the question without waiting for the development of positive symptoms, and that is by having recourse to a microscopic examination of the discharge.

For several years it has been my custom to make a microscopic examination of the secretion from every case of acute

conjunctivitis at the time the patient is first seen, and the results have been so valuable as well as instructive that I am led to make a plea for its general adoption by ophthalmologists. As an example of the difficulty in certain cases of recognizing gonorrhœal ophthalmia in its early stage, and of the fact that for several days the symptoms may be very slight, the following case is cited.

G. M., aged fifty, consulted me late in the evening of June 10th, 1893, for a severe inflammation of the left eye, due, he said, to an injury received three weeks before, from the premature explosion of a blast, which had driven particles of sand into the eye with great force. Its appearance was that of an eye in the declining stage of panophthalmitis following an extensive perforating ulcer of the cornea. The right eye was healthy in appearance, aside from a slight injection of the conjunctiva with scanty secretion adhering to the edges of the lids. This he attributed to the irritating effects from smoke arising from extensive forest fires in the mountains where he had been working. These fires are frequent in this section, and the smoke at times extremely irritating to the eyes, so that his explanation seemed plausible. He was sent to the hospital, where I saw him daily. On the third day the affection of the right eye seemed slightly worse, with increased secretion and slight swelling of the lids. This aroused my suspicions, and cover-glass preparations made from the discharge showed gonococci in typical arrangement and appearance. Treatment was at once instituted, and the eye recovered perfectly.

Questioning elicited the statement that he had had a discharge from the urethra, but it had stopped about the time the eye was injured.

To assume that an acute conjunctivitis, occurring in an individual having an urethral discharge, is gonorrhœal in nature is not always correct, and may lead to very unpleasant consequences, particularly in the mental suffering through which one who is sufficiently intelligent to appreciate the gravity of the disease must pass before the error is apparent. A case in point is the following.

J. N., aged twenty-four, bookkeeper, was referred to me by his attending physician, July 10, 1894, with the statement that he

had been under treatment for urethral gonorrhœa, and had developed what was assumed to be gonorrhœal ophthalmia. Both eyes were about equally affected. Photophobia was very marked, and the conjunctiva, both bulbar and palpebral, showed pronounced injection. Secretion was watery, with muco-purulent flakes adhering to the lashes. The lids were slightly red, but not perceptibly swollen. Duration of disease, three days. Nitrate of silver in two-per-cent. solution had been used twice daily. Though the patient was convinced that he was suffering from gonorrhœal ophthalmia, and very much alarmed, the fact that both eyes were about equally affected and the swelling of the lids was so slight made me doubt the accuracy of his physician's diagnosis. Cover-glass preparations of the secretion failed to show gonococci, and he was assured that the disease was not gonorrhœal. His anxiety being very great, however, iced compresses were ordered with boracic acid in saturated solution as a wash. The following day he complained that the compresses caused severe pain, and was willing to accept my diagnosis, so they were discontinued. Two days later he developed severe gonorrhœal rheumatism, which confined him to bed for a number of weeks. During this time the eyes remained painful and sensitive to light, but there was never any involvement of the iris or any other of the deeper structures. With the subsidence of the rheumatism the eye trouble disappeared.

Aside from the value of an immediate diagnosis a cover-glass preparation properly labelled with name and date may be valuable in a medico-legal way. This is particularly the case in private practice among married men, as the following shows.

Mr. X., a married man, occupying a public position, consulted me September 29, 1897, for what was clearly gonorrhœal ophthalmia of the left eye. He rather lamely tried to deny the possibility of such a thing, but after cover-glass preparations had been examined in his presence he acknowledged having had a discharge from the urethra, but was quite positive it was not specific in nature. His manner was so decidedly guilty that I was convinced he was fearful of domestic or other trouble should the true nature of his disease be known. The right eye was free from any signs of infection, and after he had been placed in bed at the hospital

a Buller's shield was carefully applied. Throughout the case extreme caution was exercised to prevent any infection from the other eye, which was hopelessly damaged. A non-specific infection, however, did occur to which I shall refer later.

After leaving the hospital and returning home I received a long letter from him in which he attributed the loss of his eye to an inflammation produced by the local druggist having used rose-water prepared with oil of cinnamon. He was anxious to sue the druggist for damages and loud in his denunciation of him. All that prevented him, I am certain, was the fact that the microscopic specimen in my possession was positive evidence of the true cause of the disease which destroyed the eye. Had no examination been made, it is quite probable that I should have been forced to testify, and the druggist, who was perfectly innocent, would unquestionably have had damages to pay.

There is another class of cases in which a positive diagnosis is of the greatest importance, for in them an error may result in loss of both eyes. These are the cases in which, while yet protected, symptoms of inflammation manifest themselves in the presumably unaffected eye. When a patient presents himself for treatment with only one eye affected we can never be certain that the other may not have been infected and that the disease is in the stage of incubation. If under these circumstances symptoms of inflammation appear, we might with reason assume that either our protection had been imperfect or that infection had occurred prior to the first consultation. Yet this is not always true, and grave errors may be made, for the infection may be due to other organisms than the gonococcus. Two examples may be here cited.

Case 1.—W. T., mechanic, consulted me November 8, 1897, for a severe inflammation of his left eye. Cover-glass preparations showed gonococci in abundance. Cornea hazy and prognosis bad. The right eye was apparently healthy. He was sent to the hospital, where I applied a Buller's shield. Three days later he complained of smarting in the protected eye. On removing the shield the eye was found to be slightly inflamed and the lids somewhat swollen. A tenacious muco-purulent discharge

adhered to the lashes. Though I felt assured that this condition was due to the protective dressing, it gave me much concern owing to the condition of the left eye. Cover-glass specimens of the discharge were at once made and examined on return to my office. To my great relief no gonococci were present, but in their place I found countless numbers of a small bacillus grouped mostly in the epithelium. On agar it grew luxuriantly both at room and body temperature, and retained its stain by Gram's method. No detailed study of the organism was made.

Had it been taken for granted that the disease in the right eye was gonorrhœal, as it might with reason have been, and all protection been abandoned in order to apply appropriate treatment, iced compresses, etc., true infection would have almost inevitably occurred and the patient have had the loss of both eyes to mourn.

CASE 2.—This is that of Mr. X. previously mentioned. It corresponded in every particular to Case 1. As far as tried in culture, etc., the organism appeared to be the same.

It is probable that the source of the infection in these cases was from the adhesive plaster. The warmth and moisture beneath the shield produced a favorable soil, and the bacilli gaining access to the conjunctiva excited sufficient irritation to cause a mild conjunctivitis.

The results of routine examination of conjunctival secretion having been so satisfactory in the latter part of 1896, the same procedure was adopted in cases of corneal ulcer. Making it an invariable rule its value was soon apparent, as I found in several instances that hypopyon keratitis, or, as it seems to me it should be termed, pneumococcus infection of the cornea, could be occasionally detected at its very incipiency, and much valuable time saved in treatment. It is a generally accepted belief that the galvano-cautery applied to the corneal ulceration in the early stages of the affection under consideration is the most effectual means at our command to cut short the disease. Once it gains much headway the effects of cauterization are less pronounced and frequently unavailing. Thirty-four to forty-eight hours will often be sufficient for the diseased area to more than double in size, so that early and positive diagnosis is of vital impor-

tance. Mere ocular inspection at the outset will not always give us sufficient data to justify the use of the cautery, as the classical symptoms of hypopyon, ciliary involvement, etc., require a certain time for their development. In the study of properly prepared cover-glass specimens, however, from the surface of the ulcer we have a means of diagnosis which in the majority of cases is reliable. Uhthoff and Axenfeld,[1] in a study of the disease, found the pneumococcus in twenty-nine out of thirty-five cases presenting the characteristic appearances of the affection. Their absence in the six may in part be attributed to unsuitable culture medium. Bach and Neumann,[2] out of twenty-nine cases, found the same organism in cover-glass preparations made from the surface of the ulcer in seventeen, and by cultures in twelve. Other observers have substantiated these results. In my own practice in eight cases the organism was demonstrated by cover-glass preparation in all, and in two cultures were made. It is scarcely necessary to go into the details of these cases, as they presented nothing unusual. In each there was a direct history of injury, followed in from two to four days by pain and inflammatory symptoms. In two only was there co-existent disease of the lachrymal passages. Why active treatment at the outset of the disease is so beneficial may be readily seen from a study of a well-prepared section through the ulcer and adjacent corneal tissue. Here the organisms are found some distance from what to the unaided eye would seem to be the limits of the diseased area. Penetrating the epithelium they gain access to the lymph spaces of the corneal tissue, and here multiply, extending on all sides but not reaching a great depth. When this process has been well established it is apparent that to be effective cauterization must be thorough, and extend some distance into what is apparently healthy tissue. An early diagnosis therefore may be considered a *sine qua non* to successful treatment. Finding the pneumococcus, therefore, in the secretion from a corneal ulcer is strong indication for immediate resort to the most active method of treatment.

[1] Graefe's *Archiv für Ophthalmologie*, xlii. Bd., 1 Abth.
[2] *Archiv für Augenheilkunde*, Bd. xxxiv., pp. 267–285.

To pursue the method for which my plea is made does not necessitate a thorough training in bacteriological technique. A little practice in staining cover-glass preparations both in the usual way and by Gram's method, together with a study of the pictures presented by the gonococcus and the pneumococcus, will enable one, as a rule, to make an immediate diagnosis. When we fail to find the latter in cases at all suspicious, it may be advisable to resort to cultures, but these instances will be in the great minority. To grow the gonococcus will require the aid of a trained bacteriologist, as it is probably the most difficult of all organisms to cultivate on artificial media, but fortunately the appearance of a cover-glass preparation is so characteristic that a mistake is scarcely possible to one having any training in bacterioscopy.

As it is not my purpose in this article to do more than urge the more general use of the microscope, it would be out of place to discuss the various organisms found in my cases of acute conjunctivitis.

NOTE.—When examinations are made to determine the presence or absence of the gonococcus, two cover-glass specimens should always be prepared. One may be stained with any of the aniline dyes, preferably methylene blue, as this gives the sharpest outlines. The other should be reserved for treatment by Gram's method. While the picture presented by the blue stain is characteristic and sufficient for a diagnosis, in case of any possible legal complication, it is well to have every evidence obtainable as to the identity of the organism. In the preparation of specimens from corneal ulcer, certain precautions are advisable. If the cornea is very sensitive a local anæsthetic should be employed, but cocaine had better be avoided, some other being used which can be sterilized. Eucaine β answers well for this purpose. If the ulcer is large with sloughing edges, there is no difficulty in obtaining sufficient material for examination by using the platinum loop, but when incipient this may be difficult. In such cases I have found it of advantage to use a wire in the glass rod, thick enough to permit its tip to be used in scraping the surface of the ulcer. Care should also be taken in transferring the material so obtained to the cover-glass. This should be done instantly, as any delay allows the material to dry and adhere so firmly to the wire as to prevent its being smeared over the surface of the glass.

THE USE OF THE MICROSCOPE IN OPHTHALMIC DIAGNOSIS.

A note supplementary to the preceding article of Dr. A. B. KIBBE, Seattle, Wash.

BY HERMAN KNAPP, M.D.

THE practical importance of Dr. Kibbe's plea for the more general use of the microscope by the ophthalmic practitioner has prompted me to write this note. In endorsing his appeal it is not my aim to stimulate original research. I merely want to add my testimony to his concerning the great value of microscopic, especially bacteriological, examinations in our daily practice. The diagnosis of a disease so frequent and well understood as blennorrhœal conjunctivitis may sometimes perplex even a practitioner that has seen a great deal of eye disease. In evidence of this fact I beg to detail a case recently come under my care.

George P., aged twenty-four, a laboring man of healthy appearance, came to the clinic, May 24, 1897, saying that several days before while taking off a blanket of a horse something got into his right eye, which since that time had been sore. At the inner portion of the lower lid there was an ulcer of irregular outline about 6 *mm* in its longest diameter, covered at the bottom with a thin, whitish, glassy coat, the edges raised and somewhat hardened. Opposite to it on the upper lid there were two smaller ulcers of the same character. The conjunctiva was congested, the cornea clear; there was but little conjunctival secretion. No pain. Preauricular gland swollen. The other eye healthy. I asked him whether he had any urethral discharge. He said he was married, and had never had anything of the kind. His reply seemed convincing, but the eye appearing severely diseased, I advised him to stay at the hospital. As he refused, I gave him a

boric-acid solution to be dropped into the eye, and let him bathe the eye frequently with cold water. I warned him not to contaminate the other eye.

The next day he came again, the symptoms aggravated. The conjunctiva was not much more inflamed, but the lids were thicker and the ulcers larger. They looked more like chancroids than anything else. The tissue around the ulcer was not hard enough to diagnose a true chancre. The eye looked more angry. I sent him with a note to an experienced dermatologist and syphilidologist, asking him for his opinion with regard to the nature of the phagedenic ulcers of the lid, whether chancroid, anthrax, or something else. I told the patient to bring the answer in the evening of the same day and stay in the hospital. He came the next day and brought the following note :

"The diagnosis of two initial lesions of syphilitic nature, accompanied by œdema, induration, and scleradenitis (preauricular and retro-maxillary), seems to me *highly probable.* Still before committing myself I would like to have the opportunity of examining the case again in about four days. I would exclude tubercular affection, pyogenic infection, and probably also glanders and actinomycosis."

The eye was more inflamed ; there was thin, puriform discharge from the conjunctiva, the latter being swollen around the cornea. The patient now being willing to stay in the hospital, and the disease having the clinical features of blennorrhœa, I at once examined the secretion bacteriologically, and found the characteristic picture of gonorrhœal pus with methylene blue. Then I examined some specimens with Gram's method, using Bismarck brown for restaining. The characteristic groups of gonococci were, as the cells, stained brown. I immediately went to the patient and examined his genitals. They were perfectly normal, the urethra in particular showing not a trace of discharge when stroked from behind forward, nor was there any congestion of the mucous membrane at the meatus. I told him the microscopic examination showed without a doubt that his eye was affected from a contagious disease coming from a clap, or from another similarly diseased eye. He said his wife was well, and he had not come in contact with children or anybody that had sore eyes. The only way he might have got it was in washing his eyes at the stable ; the men washed at the same place and used the same towels.

I treated the eye with cold applications, careful cleansing, mild antiseptics, and atropine ; later with nitrate of silver, 1 % or 2 % solutions. The ulcers in the lids gradually improved and got well. The inflammation was very severe, the cornea became hazy, ulcerous in the upper part, and sloughed completely, in the usual way.

The other eye was protected with a mica shield, fastened with court-plaster. The lower-outer corner of the shield was left free for the sake of ventilation. For years I have used mica shields for protection from infection in contagious disease, and from injuries after cataract extraction. They are light, transparent, and do not steam.

It is common enough that lids become excoriated and ulcerous in the course of gonorrhœal ophthalmia, but to see well-circumscribed ulcers at the margin of the lids, with elevated borders, when there is scarcely any secretion, was quite surprising to me. Whether his eye would have been saved if I had made a bacteriological examination on the first day I saw him is an idle question. Surely it ought to have been done, but who can do full justice to a crowded dispensary, if fifty and more new patients present themselves on one day?

Another case may still be of some interest.

A seventeen-year-old negro girl came to the clinic about a month ago. For several days her eyes were very red, swollen, the conjunctivæ more than the lids. Profuse whitish, thin discharge. The corneæ clear, not surrounded by a ridge of conjunctiva. She made the impression of blennorrhœal conjunctivitis in its beginning. On inquiry about a possible infection, her mother told me she did not see how such a thing could have occurred, for she was a straight and well-behaved girl. She was admitted to the hospital, and treated with cold applications and boric acid. The resident surgeon, Dr. Hogsett, found no gonococci in the secretion, but prevalently a short bacillus. Both eyes recovered without ulceration.

It is easy and takes but little time to make such examinations. They are an element of assurance in diagnosis, prognosis, and treatment, and should not be omitted in any case implying the least responsibility.

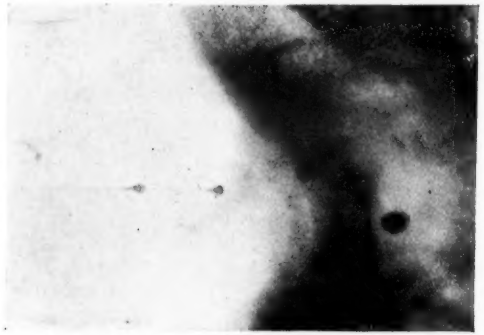

FIG. 1.—Radiograph Made with the Tube Horizontal with the Plane of Indicators.

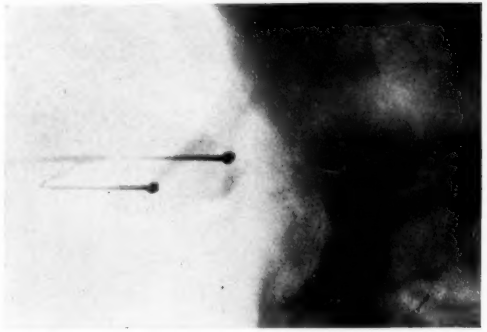

FIG. 2.—Radiograph Made with the Tube below the Horizontal Plane of Indicators.

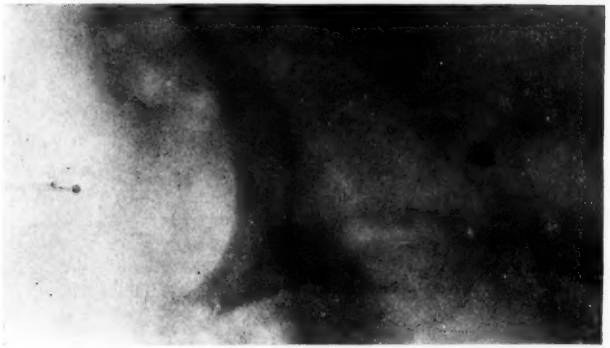

FIG. 3.—Radiograph Made with the Tube nearly Horizontal with the Plane of Indicators.

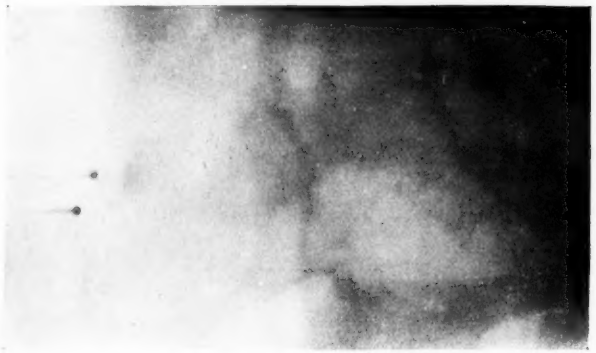

FIG. 4.—Radiograph Made with the Tube below the Horizontal Plane of Indicators.

THE VALUE AND METHOD OF DETERMINING THE PRECISE LOCATION OF PIECES OF METAL IN THE EYE BY MEANS OF THE ROENTGEN RAYS.

By Dr. WILLIAM M. SWEET, Philadelphia.

(*With seven figures in the text and four figures on Text Plate V.*)

THE brilliant results which followed the employment of the Roentgen rays as a means of diagnosis in general surgery, early directed attention to the possibility of using the new form of radiant energy in determining the presence of foreign bodies in the eyeball, and their approximate position. The first investigators in this branch of ophthalmic surgery, from experiments on the eyes of animals, regarded the structures of the eyeball and its bony surroundings as insurmountable obstacles to the employment of the rays in determining the presence of metal bodies in the eye, a natural deduction from the unsatisfactory apparatus then employed, which furnished rays of a low degree of penetrability only. Darier[1] and Harnisch[2] both showed the great resistance offered by the structures of the eyeball to the passage of the rays, even when the exposures were of long duration. Van Duyse[3] and Lewkowitsch[4] believed that the orbital walls were impenetrable to the rays, and devoted their experiments to the location of bodies in the anterior segment of the globe. Lewkowitsch adducted and abducted the eye to the maximum in order to include as large a portion of the eyeball as possible

[1] *Annales d'Oculistique*, t. 115, p. 218.
[2] *Annals of Ophth.*, April, 1896.
[3] *Archiv. d'Opht.*, Feb., 1896.
[4] London *Lancet*, Aug. 15, 1896.

upon the photographic plate, and Van Duyse, to achieve the same result, suggested the production of an artificial exophthalmus by the injection of a salt solution beneath Tenon's capsule.

WILLIAMS[1] was the first to report a case of the successful extraction of a piece of metal from the vitreous which had been previously located by the X-rays, the body being a fragment of copper cartridge-shell. The photographic plate was attached to the side of the head, and the rays were passed partly across the bridge of the nose, and partly through the thin nasal and orbital bones to the injured eye, and to the plate. Owing to a blow received upon the eye several weeks later, resulting in irido-cyclitis, the ball was enucleated.

CLARK[2] proposed the insertion of a narrow strip of sensitive film in the nasal cavity against the septum until its point touched the lower surface of the cribriform plate of the ethmoid bone, and demonstrated on the skull that by this means a foreign body in the vitreous could be located. This author reported a case of the successful removal of a piece of steel from the iris angle located by the rays, but not in the manner described.

A great impetus to the work was given by the labors of STERN, at the Philadelphia Polyclinic, who early demonstrated the possibility of obtaining shadows on the photographic plate of metallic bodies situated in any part of the eyeball or orbit. The plate was, in all instances, bandaged to the temple of the side corresponding to the injured eye, the tube being to the opposite side of the head, and slightly forward. Of the cases of foreign bodies in the eye located by Stern, two were reported by HANSELL,[3] one by RING,[4] and two by DE SCHWEINITZ.[5] The case reported by de Schweinitz is interesting from the fact that two unsuccessful attempts were made to remove the body, and it was only after the radiograph indicated its approximate position that it was

[1] *Trans. Amer. Ophth. Soc.*, vol. vii., p. 708.
[2] *Ibid.*, p. 711.
[3] *Amer. Jour. Med. Sci.*, Nov., 1897.
[4] *Codex Medicus*, Feb., 1897.
[5] *Amer. Jour. Med. Sci.*, May, 1897.

extracted with the magnet with the preservation of $\frac{6}{12}$ vision.

Of the methods which have been employed to determine the approximate position of the foreign body in the eyeball, the study of the shadow of the body in relation to the shadows cast by the bones of the orbit have given fairly good results in the hands of operators of experience in the making of radiographs of the orbital contents. There is always, however, a possibility of error in the determination, owing to the varying situation of the eyeball in the orbit, both physiological and pathological. The investigations of COHEN[1] have shown variations of as much as 10 *mm* behind the edge of the orbit, and 12 *mm* in front of the same in healthy individuals.

The employment of triangulation, either from two exposures upon the same plate with the tube in different positions, or by several separate exposures, is more accurate in its results. EXNER[2] employs two leaden discs, perpendicular to each other, as fixed points of measurements, to determine the relative value of the triangles, this method being especially applicable to the needs of the general surgeon. OLIVER[3] reports three cases of foreign bodies, two in the orbit and one in the eyeball, located by a method devised by Leonard, which differs from that of Exner in the fact that the base line for triangulation is anterior to the cranial shadow. A number of exposures are made to give a multiple series of triangles.

DAHLEFELD and POHRT[4] experimented with shot and pieces of wire artificially introduced in the orbits of cases of phthisis bulbi, and from a study of the shadows of these bodies on the plate located a piece of steel 3 x 1 *mm* in the eyeball. They recommend that several exposures be made in each case, approaching the eye from different directions, so as to clear the lateral orbital border.

FRIDENBERG[5] makes two exposures of the eye and orbit

[1] *Klin. Monatsblätt.*, 1867.
[2] *Wiener klin. Wochen.*, Jan. 7, 1897.
[3] *Trans. Amer. Ophth. Soc.*, vol. viii., p. 85.
[4] *Deutsch. med. Wochen.*, April 29, 1897.
[5] *Medical Record*, May 15, 1897.

at right angles to each other, in one of which two plates are bandaged to the eye in order to obtain the closest possible approximation to the eyeball. FRIEDMAN[1] also considers the bitemporal and fronto-occipital use of the rays as the best suited to the detection of foreign bodies. He reports three cases, in two of which the presence of the body was shown upon the plates, while a negative result was secured in a third, and the absence of a foreign body subsequently verified by enucleation.

KIBBE[2] places the tube in a line joining the temporal edge of each orbit, and measures the distance of the platinum of the tube from the plate. Two exposures are made, one in this position, and one with the tube lowered four inches. Two images on the same plate are secured, from which the position of the body is determined by mathematical calculation. He reports a case in which it was impossible to determine whether the foreign body had penetrated the eyeball, but by means of the X-rays its presence was demonstrated in the eyelid.

STÖCKL[3] employs small plates of lead, fastened at numerous points surrounding the orbital margin, and, from a study of the shadows of these objects upon the photographic plate in relation to the shadow of the foreign body, determines the location of the metal in the eye. By this means a shot in one case, and a piece of copper in another patient, were located and successfully extracted in Fuch's clinic.

At the Washington meeting of the American Ophthalmological Society, May, 1897, the writer described[4] a method of locating foreign bodies in the eye and orbit, employing for this purpose two metal indicators, one pointing to the centre of the cornea and the other situated to the temporal side, at a known distance from the first. Two exposures are made, to give different relations of the shadows of the indicators and the body in the eyeball or orbit, one with the tube horizontal or nearly so with the plane of the indicators, and the other with the tube at any distance below this plane.

[1] *Klin. Monatsblätt.*, Oct., 1897.
[2] ARCHIVES OF OPHTH., Oct., 1897.
[3] *Wiener. klin. Wochen*, No. 7, 1898.
[4] *Trans. Amer. Ophth. Soc.*, vol. viii., part i., p. 91.

The correctness of the determination of the position of foreign bodies in the eyeball by this method was shown by a case reported by Dr. William Thomson.[1] The patient had been struck in the left eye eight months before by a piece of steel from a chisel. There was a scar in the sclera 2 *mm* from the corneal border, near the lower edge of the tendon of the external rectus muscle. Commencing at this point in the vitreous a large mass of band-like cicatricial tissue extended backwards and could be traced in the vitreous to the temporal side of the papilla. The steel was nowhere to be seen, and it was believed that it was firmly encysted if it had remained in the ball, although it was not certain that it might not have passed through the sclera posteriorly. The position of the body was shown by the method here described to be in the vitreous chamber 3 *mm* below the horizontal plane of the eye, 5 *mm* to the temporal side, and 20 *mm* back of the centre of the cornea. The steel was subsequently removed from the position indicated by the radiographs, and the eyeball was preserved.

The principle of this method of localization may be understood from the perspective drawing, Fig. 1, in which a candle flame is used to represent the X-ray tube. Rays of light coming from the candle when at A, in casting shadows upon a flat surface of two ball-pointed rods and an object in a sphere representing the eyeball, give the view shown on the surface C. In this instance the candle is slightly in front of the vertical plane passing through the two indicating balls, and consequently the shadow of the centre ball will be thrown back of that of the outer ball. When the source of light is carried below the horizontal plane of the two rods, to B, the shadows of the indicators take the positions shown on the surface D, while the relative position of the body also changes. Knowing the distance of one of the balls from the centre of the cornea and the distance between the balls, the position of the metal in the eye may be readily determined, since the shadow of the body preserves at all times a fixed relation with respect to the shadows of the indicating balls, in whatever position the candle is placed.

[1] *Trans. Amer. Ophth. Soc.*, vol. viii., part i., p. 88.

In carrying out this method in practice it is essential that the axis of the eyeball shall be parallel with the two indicators and with the photographic plate, that one of the indicating balls point to the centre of the cornea and be at a known distance from it, and that the two indicating balls be in a perpendicular line with the plate and at a known distance from each other. Simplicity has been secured by combining the plate-holder and indicators into a special apparatus, which is bound to the side of the head, as shown in

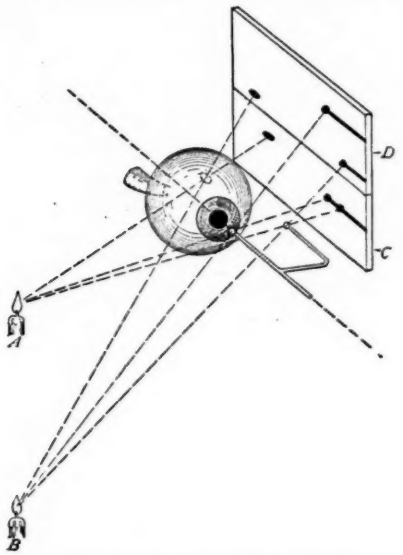

FIG. 1.—Principle of Method of Localization.

Fig. 2. The arrangement of the parts of this apparatus are such that the indicators, while freely adjustable, are always parallel to each other and to the plate, and the two balls are constantly perpendicular to the plate and 15 *mm* apart at their centres. The only measurement necessary to be made, therefore, is the distance of the centre ball from the centre of the cornea, and this may readily be done through the transparent celluloid backing of the holder, upon which there is a scale in millimetres. The distance of the platinum

anode of the tube from the centre ball may also be measured in order to allow for the divergence of the rays, although in an object as small as the eyeball the rays from a tube 13 to 15 inches away may be considered to pass through the ball parallel, the divergence being so small as not to appreciably affect the result.

The determination of the position of a foreign body in the eye from two radiographs made by the method described may be understood from the following case.

FIG. 2.—Indicating Apparatus and Plate-Holder.

CASE 1.—P. K., a track-walker, was shot in the face by a rabbit hunter on November 1, 1897. Several of the shots struck the soft tissues of the neck and face, while one entered the orbital structures just below the supra-orbital foramen of the *right* side, and another penetrated at a point about 3 *mm* below the superior border of the orbit of the *left* side. The man was sent by the attending physician, Dr. A. R. Craig, of Columbia, Pa., to Dr. G. E. de Schweinitz, whose examination of the case on December 13, 1897, showed the following ocular conditions: In right eye, vision $\frac{6}{18}$; vitreous containing a gray floating mass, which at times obscures a view of the fundus; disc of good color; diffuse retino-choroiditis, everywhere characterized by pigment degen-

eration and absorption. In left eye, red reflex above, but no fundus view possible on account of the denseness of the vitreous. At the request of Dr. de Schweinitz I made a number of radiographs of each eye.

Reproductions of two of the radiographs made of the left eye are shown on Text Plate V., Figs. 1 and 2. In order to facilitate the measurements of the distance of the shadow of the shot from the shadow of the indicating balls, outline

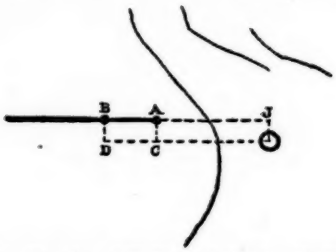

FIG. 3.—Outline Drawing of Radiograph Made with Tube Horizontal with Plane of Indicators. Reduced one third actual size.

drawings of these radiographs are shown in Text Figs. 3 and 4, the former giving the relations of the indicators and shot when the exposure was made with the tube horizontal to

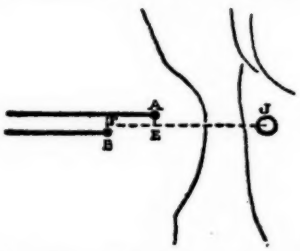

FIG. 4.—Outline Drawing of Radiograph Made with Tube below Horizontal Plane of Indicators. Reduced one third actual size.

the plane of the indicators, and the latter when the tube was below this plane.

In determining the position of the foreign body in the eye two circles, 24 *mm* in diameter, are drawn upon paper, as shown in Fig. 5, one to represent a horizontal and the other

a vertical section of the average adult eyeball. Upon the vertical section a spot is made at the centre of the circle, representing the position of the centre indicator of the apparatus when the exposure was made. The distance between the two indicators is measured towards the temporal side, and a spot made to show the position of the external indicator.

On the circle representing a horizontal section of the eyeball, a spot is made anterior to the centre of the cornea, and at the same distance that the centre indicator was from the eye when the radiograph was made. Another spot to the

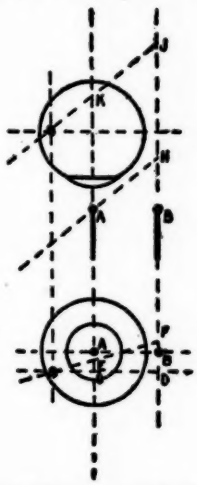

FIG. 5.—Diagrammatic Circles Representing the Eyeball. Reduced one third actual size. Upper Circle, Horizontal Section ; Lower Circle, Vertical Section.

temporal side, measured by the distance between the two balls of the apparatus, marks the situation of the external indicator.

On the negative made with the tube horizontal to the plane of the indicators, the distance is measured that the shadow of the body is above or below the shadow of each of the indicators, and the measurement is entered above or below the spots representing the two indicating balls on the circle showing the vertical section of the eye. In this patient the distances, AC and BD, are entered below the two

spots A and B on the circle. A line drawn through the points C and D gives the direction of the rays from the tube when the shadow of the foreign body was cast upon the plate.

On the negative made with the tube below the horizontal plane of the indicators, are made similar measurements of the distance the shadow of the body is above or below the shadow of each of the indicators, and these distances are entered as before upon the vertical section of the eye above or below the spots representing the two indicators. In this instance the measurements are AE and BF. A line is now drawn through the points E and F, which gives the direction of the rays when the second negative was made. Since these two lines indicate the plane of the shadow of the foreign body at each exposure, where the lines cross must be the location of the body in the eye as measured above or below the horizontal plane of the globe and to the temporal or nasal side.

In order to determine the distance of the body back of the centre of the cornea, the negative made with the tube horizontal is again taken, and the distance is measured that the shadow of the centre ball is posterior to that of the external ball. This distance is entered directly above the external ball on the diagram representing the horizontal section of the eye. From this point (H) a line is drawn through the ball (A) of the centre indicator, which gives the direction of the rays from the tube when the exposure was made. On the same negative is measured the distance the shadow of the foreign body is back of the shadow of each of the indicators, and these distances are marked on the diagram perpendicular to the two balls. A line drawn through the points J and K gives the plane of shadow of the foreign body. When the distance of the tube away is known, the line through J is drawn from the platinum anode, as will be explained when speaking of foreign bodies in the orbit. Where a line perpendicular to the position of the foreign body, as shown on the vertical section of the eyeball, intersects the line passing through JK, is the position of the foreign body as respects its distance back of the anterior portion of the eyeball.

Measurements made from the radiographs taken of the right eye located the shot in the orbit, 15 *mm* back of the centre of the cornea, 17 *mm* to the nasal side, and 6 *mm* above the horizontal plane of the eyeball.

When the photographic plate is in place at the side of the head it is necessary, in the majority of cases, to arrange the point of fixation so that the cornea is rotated slightly inwards, in order that the visual axis shall be parallel with the plane of the plate. This rotation of the eyeball in no way affects the method of locating bodies within the globe, but when the body has penetrated into the orbit outside of the eyeball the convergence necessary to insure parallelism of the visual axis and the plate leads to error in the determination of the position of the metal. To eliminate this factor of error necessitates a knowledge of the angle of the orbit with the plate, or, what is equivalent, the amount of deviation of the eyeball from the primary position, and the employment of this angle in plotting the diagrammatic circles representing the eyeball. Another error arises from the false projection of the shadow of the body in the orbit in relation to the shadows of the two indicators, owing to the greater divergence of the rays as the distance between the centre indicator and the foreign body increases. By measuring the distance of the platinum plate of the tube from the centre indicator, the false projection may be eliminated in the calculation.

In the following case is shown the method of locating foreign bodies in the orbit outside of the eyeball.

CASE 2.—A miner, aged twenty years, while gunning on November 9, 1897, was accidentally shot by his companion, standing eighty yards distant, one shot causing a slight flesh wound of the chin, another penetrating about three quarters of an inch into the soft tissues of the nose, and a third entering at the inner angle of the commissure of the left eye. He was brought to the Jefferson Medical College Hospital two days after the injury by his physician, Dr. H. C. Brunner, of Traverton, Pa. In reporting the case, Dr. H. F. Hansell, under whose care the patient entered the hospital, stated [1] that "the lids and conjunctiva were ecchymotic,

[1] *Trans. College of Physicians of Phila.*, Nov. 16, 1897.

the ball uninjured but widely divergent and slightly exophthalmic, the pupil dilated and irresponsive, the accommodation paralyzed, and the media and fundus were entirely normal. The man could rotate the eye only outward, all other motions being completely abolished. At the expiration of eight days the power of the levator and that of the superior rectus had partly returned, otherwise the conditions were unchanged. From the paralysis of all the muscles governed by the third nerve, it would seem as though the trunk of the nerve had been severed, yet it is hardly conceivable that such a severe injury could have occurred without involvement of adjacent tissues."

A number of radiographs of the case was made, two of which are shown on Text Plate V., Figs. 3 and 4. In these exposures the distance of the centre indicator from the centre of the cornea was 4 *mm*, the distance of the anode plate of the tube from the centre indicator was 35 *cm*, and the approximate angle of the orbital axis with the plane of the photographic plate was 30 degrees. When the exposures were made the eyelids were closed, since the position of the eyeball in no way affected the result of the findings.

In the illustration, Fig. 6, are shown the usual circles to represent the vertical and horizontal sections of the eyeball, upon which are noted the position of the indicating balls when the exposures were made. A line (AP) to the right of the circles represents the plane of the photographic plate, while another line (AO) through the horizontal section of the eye, and at an angle of 30 degrees with the first line, indicates the axis of the orbit with the plate. The outlines of the orbital walls in the horizontal section are also shown for purposes of greater clearness, although not essential.

Measurements similar to those made in the previous case, from the radiographs on Plate V., Figs. 3 and 4, show the position of the shot to be above the horizontal plane of the eyeball and to the nasal side, and at the extreme apex of the orbit. In determining the location of the body back of the centre of the cornea, the line passing through the centre indicating ball on the horizontal section of the eye is continued a distance of 35 *cm* from this ball, the spot made representing the platinum plate of the tube when the radiograph was made.

Instead, therefore, of measuring the distance the shadow of the foreign body is back of the shadow of each of the indicators, as described in Case 1, the measurement is made for the external indicator only, and this distance marked on the diagram perpendicular to the external ball. From this spot (J) the line representing the plane of shadow of the foreign body is drawn to the platinum of the tube. By this means

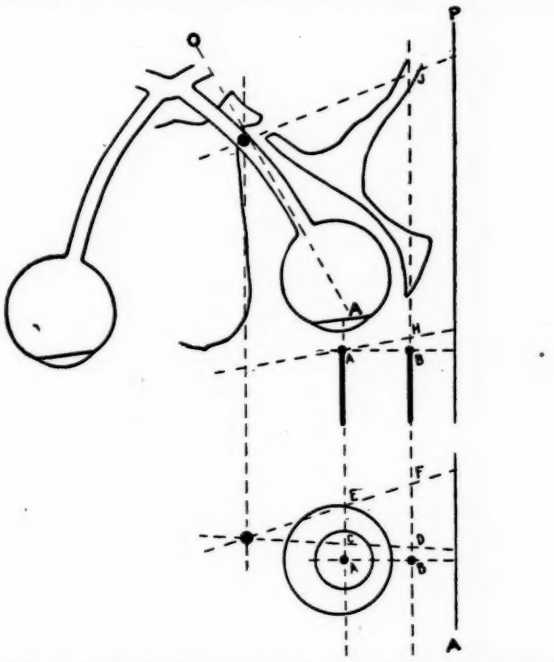

FIG. 6.—Diagrammatic Circles Representing the Eyeball. Reduced one third actual size. Upper Circle, Horizontal Section; Lower Circle, Vertical Section.

there is eliminated the false projection caused by the divergence of the rays.

In gunshot injuries of the face, where several shot have penetrated the tissues immediately surrounding the eye, it is possible by the method described to locate from one set of negatives the body in the eyeball, and also those which may be situated in adjacent structures and even in the brain.

When the exposure is made, the patient fixes the gaze upon an object so placed that the visual axes assume the primary position, and the angle of the plate with the line of vision is then measured. The diagrammatic circles are arranged the same as for the location of foreign bodies in the orbit.

Success in the use of the X-rays in determining the presence and position of foreign bodies in the eyeball or orbit can only be achieved after a most careful attention to the details of the work. Apart from the skill and experience of the operator, the character of the apparatus employed, the position of the tube when the exposures are made, and the steadiness of the patient exert important influences upon the final results. The difficulties of the work increase with the smallness of the foreign body, especially if it is situated some distance from the photographic plate. Many of the early failures are traceable to imperfect apparatus, but, with the more powerful coils now available, better means of regulating the current, and with tubes that give a uniform and constant source of X-rays, it is now possible to ascertain, in almost every instance of injuries of the eye, whether a foreign body is in the eyeball or orbit, together with its approximate position.

With a view of determining the factors likely to contribute to the greatest measure of success in locating bodies in the eyeball or orbit, experiments have been made upon the living subject and upon a cadaver, the results of which are here given.

In a paper[1] read at the Philadelphia meeting of the American Medical Association, June, 1897, upon the use of Roentgen rays in eye work, I recorded some experiments made upon a cadaver to show the kind of tube best suited for this purpose. The shrunken eyeballs were removed, and in their place were substituted fresh pig's eyes, in which had been inserted small pieces of steel or very fine wire, extending from the centre of the cornea, through the structures of the globe, to the retina. The results of these experiments showed the superiority of tubes in which the cathodal terminal was so ground and polished that the rays were focussed to a small

[1] *Journal Amer. Med. Assn.*, Jan. 1, 1898.

point upon the platinum anode. Tubes so constructed gave clear and sharp shadows of the bodies in the eye upon the photographic plate, while exposures under exactly similar conditions with tubes in which the point of focus of the rays on the platinum was large gave a blurred and almost indistinguishable shadow of the bodies. The use of tubes with small and large focus points in exposures upon the living subject has fully agreed with the results of the experiments, and emphasized the value of the former character of tube for this work.

For the production of radiographs giving marked contrast between the shadows of the foreign body and the orbital bones, a tube is required which may be run at high vacuum without the resistance offered to the passage of the current reaching a point that will interfere with the generation of the rays. After employing various forms and makes of Crookes's tubes, I have found that the Queen Self-Regulating Tube gives results which are more satisfactory than those of any tube with which I have experimented. In this tube, the principle of which is shown in Fig. 7, the large bulb is exhausted, so that normally it offers great resistance to the passage of the current. When it is put in operation the current follows the pathway of least resistance, sparking across the gap AB to the hinged metal rod, and thence through the small auxiliary tube of moderately low vacuum to the other electrode. The auxiliary tube contains a cathode, C, the function of which is to bombard the small bulb and heat the potassium hydrate which it contains, thereby lowering the vacuum in the large bulb by reason of the gas evolved, and allowing the current to pass in the ordinary way. The potassium soon cools, and reabsorbs the gas until it is again heated by the shunt circuit. By this means an occasional spark across the gap keeps the vacuum in the large bulb uniform and, to a degree, dependent on the distance between A and B. When the tube is running at the proper vacuum for eye work, the bones of the hand, when viewed through the fluoroscope, are light gray in color, showing that the rays are readily penetrating the bony structures. The best results are secured when the spark gap of the tube is set at

four inches. In my recent work I have taken the current from the ordinary direct-current lighting circuit, regulating the amount sent into the tube by means of a rheostat.

In dealing with very small pieces of metal in the eyeball or orbit the position of the tube in relation to the eye and photographic plate has an important influence upon the distinctness of the shadow cast by the body. The nearer the tube approaches a vertical plane touching the centre of each

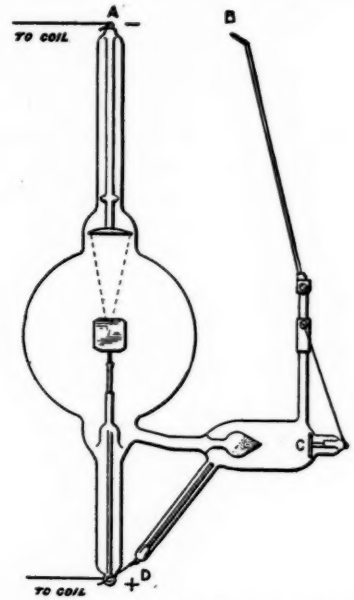

FIG. 7.—Principle of Automatic Regulating X-Ray Tube.

cornea, the sharper will be the shadow of the object cast, since the rays thereby become more nearly perpendicular to the photographic plate. As the tube is brought farther forward the shadow of the body becomes distorted, and in very small objects may be so indistinct as to be unrecognizable. In cases of doubt as to the presence of a foreign body in the eye, it is good practice to make several exposures with the tube in various positions, in order to cause the body,

if present, to be shadowed through the thinnest portion of the bones of the orbit, so that there shall be sufficient contrast to assist in revealing its presence.

During the exposure the patient should lie upon his back. This position tends to relax all muscular movements and ensures greater steadiness of the head and body than when sitting upright with some form of head-rest. The plate-holding apparatus is bound firmly to the side of the head, with the centre indicating ball opposite the centre of the cornea. An exposure of four minutes is ample to locate bodies, either in the eyeball or orbit, and excellent results have been secured in one fourth this time.

Since the X-rays act in accordance with the usual laws of light and shadow, it is evident that a point is reached in this work where the foreign body becomes too small to be shadowed upon the photographic plate. This is especially the case if the metal is situated to the nasal side of the eyeball, and therefore some distance away from the plate. It is equally true, however, that chips of metal which are too small to be shown by the X-rays seldom strike the eye with sufficient force to overcome the resistance of the ocular structures and to penetrate deeply into the globe. The following case is interesting as showing the difficulties of the work in locating small bodies in the eye.

Case 3.—A boy, aged thirteen years, came to the Jefferson Medical College Hospital, September 13, 1897, stating that he had been struck in the left eye by a piece of steel from a hammer while engaged in keying up some shafting. He did not know the size of the piece of metal, but an examination of the hammer showed a small spot of fresh fracture near the circular edge. There was considerable subconjunctival hemorrhage, and at a point 4 *mm* below the centre of the cornea and 6 *mm* to the nasal side was seen a small, narrow scleral wound. The lens and iris were both normal. With the pupil dilated an object with a distinctly metallic lustre was seen suspended in the vitreous, about 3 *mm* back of the lower and inner portion of the lens margin. There was slight motion of the body with movement of the eyeball, although its general situation in the vitreous remained unchanged. The body presented the appearance of a thin wafer of

metal, resting obliquely in the vitreous, with the forward edge pointing in a line with the bridge of the nose.

Although the position of the steel was clearly determined by the ophthalmoscope, a number of radiographs were taken. The exposures were made with the photographic plate to the left side of the head, and the X-ray tube in various positions towards the right side. Of the four negatives secured only one recorded the shadow cast by the body, and even in this instance the impression on the plate was so faint that it would most probably have failed to arrest attention had not the presence of the metallic body in the eye been previously known.

The metal was subsequently removed by the Hirschberg magnet, with a resulting vision of $\frac{6}{6}$ partly. The body was a little over 1 *mm* long, slightly less than 1 *mm* wide, with one side flat and the other side presenting a sharp ridge near the centre, at which point the body was $\frac{1}{2}$ *mm* thick. From this ridge the body sloped away in all directions to almost a knife edge at the margins. The weight of the metal was 3 milligrammes.

No better example of the difficulties of the work of locating foreign bodies in the eye by means of the X-rays could have been found than is furnished by this case. The body was not only small but extremely thin, with the thinnest portion presenting towards the tube, and therefore nearly perpendicular to the photographic plate. In a nervous and restless patient, as the boy proved to be, the body was in motion with each movement of the eyeball, however slight. Circumstances compelled the making of the exposures while the patient was sitting in a chair and using a head-rest, instead of in a recumbent posture. The body being to the nasal side of the eye, and therefore at a considerable distance from the plate, also made its detection extremely difficult.

The following cases may be added in proof of the usefulness of the X-rays in the diagnosis of foreign bodies in the eye.

In the one reported by Dr. H. F. Hansell,[1] the X-rays not

[1] College of Physicians of Philadelphia, March 15, 1898.

only indicated the presence of a metal body which was causing severe eye symptoms, but led to the discovery of a second body outside the eye.

CASE 4.—H. L., aged thirty-five, was wounded in the left eye by a piece of sheet steel on January 22, 1898. Examination shortly after the accident showed a linear incision 3 *mm* in extent to the nasal side of the lower extremity of the vertical diameter of the cornea, involving both cornea and sclera; anterior chamber filled about one fifth of its capacity with blood. In a few days the anterior chamber cleared up, and a small ragged opening could be made out in the periphery of the iris opposite the corneal cut.

Several radiographs were made, each of which recorded the shadows made by *two* metal bodies. One was located in the posterior chamber immediately under and to the nasal side of the lower end of the vertical diameter of the lens. After an iridectomy, the body was extracted by the Hirschberg magnet. The fragment was 4 *mm* long, 2 *mm* wide, and $\frac{9}{10}$ *mm* thick, and weighed 9.5 *mg*. The eye recovered from the injury, but vision is reduced to the perception of large objects on account of blood in the vitreous chamber.

One of the unique features of the case was the unexpected discovery by the rays of the presence of a second piece of metal, of which no history could be obtained. It was located just anterior to the external orbital angle, and very close to it, in the soft tissues of the upper lid. The finding was confirmed by passing the magnet over that part of the lid, the skin being invariably puckered and elevated. That the body did not enter contemporaneously with the other injury is proved by the absence of any external wound, and the different character and quality of the steel as compared with the other body. With the aid of the magnet it was readily excised, and found to be 6 *mm* in length, 1 *mm* in width, $\frac{1}{4}$ *mm* in thickness, and weighed 23.5 *mg*.

In the case reported by Dr. G. E. de Schweinitz,[1] the localization by means of the X-rays was verified by several clinical symptoms, but the patient refused operation.

[1] College of Physicians of Philadelphia, March 15, 1898.

Case 5.—A man, aged forty, while working in a car shop on November 6, 1895, was struck by a piece of steel, which entered the left eye, probably near the corneal margin at the inner side. His physician stated that in March following an X-ray photograph was obtained which seemed to indicate that a foreign body was located in the orbit at the upper nasal side. On February 26, 1898, vision was $\frac{6}{20}$, eye quiet, marks of a previous iritis, capsule and lens partly opaque, and floating opacities in the vitreous. With undilated pupil no foreign body could be detected in the vitreous or in the coats of the eye.

Radiographs were made, and the body located 11 *mm* below the centre of the cornea, 3 *mm* to the nasal side, and 10 *mm* back of the centre of the cornea. In order to determine if the body moved with rotation of the ball, two negatives were made, one with the eye in the primary position, with the centre indicator opposite the centre of the cornea, and one with the ball rotated as far as possible downwards. The shadow of the body moved upwards towards the plane of the indicators to an extent nearly equal to the rotation of the cornea downwards, which seemed to indicate that the body was in the sclera.

After the radiographs had been made, the pupil was dilated, and by causing the patient to rotate the eye downwards a small patch of atrophy could be seen, and in the centre of it a small patch of black exactly in the position which the photographs indicated should be the location of the foreign body. By carefully palpating the globe with a probe the patient in nearly all instances stated that there was tenderness in the region just mentioned. The field of vision was markedly contracted, and there was uncertain limitation opposite to where the foreign body was supposed to lie. The patient refused to permit an exploratory operation.

Another case reported by Dr. G. E. de Schweinitz[1] presented the following history:

Case 6.—A. G., aged twenty, while striking a drill press with a heavy hammer on March 25, 1898, was hit in the left eye by a fragment of steel, which penetrated near the centre of the cornea. Examination made seven hours after the accident found the lens already entirely cataractous, the media being so clouded that no view of the fundus could be obtained, nor was it possible to determine if the metal still remained in the lens. Radiographs

[1] College of Physicians of Philadelphia, April 19, 1898.

made the following day indicated a piece of metal about 3 *mm* long and 1 *mm* wide situated 3 *mm* below the horizontal plane of the globe, nearly 2 *mm* to the nasal side and 23 *mm* back of the centre of the cornea. The second day after the injury an incision was made through the sclera just below the lower margin of the external rectus, and the broad, flat extension point of a Hirschberg magnet introduced for 15 *mm*, so as to bring it as nearly as could be calculated over the position of the macula. On withdrawing the extension point, a piece of steel of triangular shape, of the size indicated by the X-rays, and weighing 9 *mg*., was found adherent to it. Two months after the operation the eye was in good condition, although vision was reduced to light perception owing to the opaque lens.

This case exhibits the readiness with which metallic bodies situated in the posterior portion of the eyeball may be located by the X-rays. Until the radiographs were taken, there was no means of determining whether the metal remained in the lens or lodged in the vitreous chamber, or had passed through the globe into the orbit. Another point of value brought out by this case is the importance of early operation, before the metal has become covered by exudate. The failure to extract the body in the following case, which was under the charge of Dr. GEORGE STRAWBRIDGE, was due to the inability to bring the magnet point against the metal body, because of the mass of new tissue in which it was imbedded.

CASE 7.—P. D., aged thirty-five, was struck in the left eye by a piece of steel, on April 4, 1898. Examination, made by Dr. Strawbridge shortly after the injury, showed a penetrating wound of the sclera, near the inner border of the cornea, a tear in the iris, and the anterior chamber three fourths filled with blood. An attempt was made at once to remove the metal supposed to be within the eye through an incision in the sclera between the tendons of the inferior and external recti muscles, and six entrances of the magnet tip were made without success.

The eye remained quiet for several weeks, at the end of which time there developed attacks of pain and increased congestion. Several radiographs were taken, and the body located 4 *mm* back of the centre of the cornea, 3 *mm* below the horizontal plane of

the ball, and 6 *mm* to the nasal side. On May 12th, an incision was made in the sclera, a short distance from the indicated location of the metal, and, although the large point of the Hirschberg magnet was passed a number of times over the spot, the body was not removed. After the eye was enucleated, a piece of steel, 8 *mm* long and 2 *mm* wide, was found in the lower inner quadrant of the ciliary body, at the exact location indicated by the X-rays. The point of the magnet had been passed over the spot at each insertion, but failed to remove it, owing to the mass of exudation covering it.

In the following case, reported by Dr. LOUIS F. LOVE,[1] much of the difficulty in removing the foreign body was due to the exudation covering it.

CASE 8.—M. C., aged thirty-three, was chipping rivet heads on March 2, 1898, and a piece of the metal entered the left eye near the outer lower corneal-scleral border. The conjunctiva was œdematous, the iris prolapsed and vitreous protruded, and all fundus reflex was lost. The X-rays located the body 13 *mm* back of the centre of the cornea, 11 *mm* above the horizontal plane of the ball, and 2 *mm* to the temporal side. On March 10th an attempt was made to reach the body with a Hirschberg magnet, the old wound of entrance being enlarged, but after several failures, owing partly to imperfect working of the battery, the trial was abandoned. A large amount of bloody serum poured from the globe during the operation, and the ball almost collapsed. A few days later the globe had regained its shape, and additional radiographs were made, which indicated that the position of the body had not been changed by the manipulations necessary in the first operation. A second attempt to remove the body by the magnet was successful, an incision being made in the sclera at the equator, close to the indicated location. The wound healed readily, leaving the globe in fairly good condition. The body consisted of a thin shell of metal, nearly 6 *mm* in diameter, and weighed 73.6 *mg*.

I have employed the rays in a large number of cases of suspected foreign bodies in the eyeball, and in no instance have I seen any serious effects follow their use. In two or three cases there was slight redness of the skin for a few

[1] College of Physicians of Philadelphia, April 19, 1898.

days, but no severe dermatitis, such as has been reported by others, notwithstanding that many of the patients were subjected to the rays for longer periods than is required in practice, simply for the purpose of experimenting with methods of localization. In one case there was loss of the hair covering a spot about the size of a silver dollar just above the ear, but this followed exposures extending over a period of two weeks. Nevertheless, I believe it is a safe plan to limit the number of exposures at one time to four, which would at the most subject the person to the rays for a period of sixteen minutes. In this way it is possible to subsequently note the effect of the rays on the skin, and, if additional radiographs are desired, postpone the second sitting for several days in case marked redness follows the first exposures.

ON DIEFFENBACH'S METHOD OF BLEPHAROPLASTY.

By Dr. J. SIKLOSSY, Jr., Buda-Pesth.

Abridged and Translated by Dr. J. A. Spalding, Portland, Me.

DIEFFENBACH'S method is the one that has been longest and most often employed in the formation of the lower eyelid. It is peculiarly fitted for curing cicatricial ectropion, as well as for covering defects in the lids arising from the removal of neoplasms, and in so doing it is of no consequence whether the lid has been partly or wholly removed. The operation consists in so loosening the tissue or tumor that a defect remains in the shape of a triangle, with the base toward the margin of the lid. This defect is then covered by a sliding quadrilateral flap, the inner margin of which is formed by the outer limb of the defect, the upper margin by the continuation of the same, whilst the outer margin is cut parallel with the inner one.

This operation gives excellent results, and when the base of the flap is folded over there remains no ridge, provided *that it is made smaller by half than the upper portion, and that the inner tip is not sutured at the inner margin of the lower lid, but above the inner commissure at the inner side of the skin on the bridge of the nose*, so that when the flap shrivels the skin of the nose is stretched, and not the delicate inner margin of the lid. In the latter event, the lid will drag away from the globe, the punctum will be everted, and disagreeable epiphora ensue.

Nevertheless, this method has the disadvantage of producing a disfiguring scar on the face from the folding of the

flap, which can, however, be avoided by observing the following suggestions.

If in any case either lid is occupied on the inner or outer angle by a neoplasm (no matter how large a portion of the lid has to be sacrificed for complete extirpation), we remove the neoplasm by incisions in the form of a triangle with the base up, or in the case of the upper lid, with the base down. Next we carry a straight horizontal incision from the outer commissure as far even as the auricle, if necessary. The skin beneath this incision is then loosened, so that it can be slid across. The size of the triangle teaches us in time just how far to carry the long horizontal incision out toward the auricle, and also how far back or low down on the cheek we shall have to undermine the skin in order to make a full flap. If when we come to suture the parts the skin has to be stretched a good deal, we can, additionally, make a second undermining incision, in order to avoid tension. The scar of this operation is mostly insignificant. The horizontal margins of the long incision can then be sutured obliquely, so that the tension falls equally on all the sutures combined. The margins of the horizontal incision are equally thick, and of the same consistency, so that after final union they show a slight cicatrix which in the wrinkles of the face is difficult to recognize.

When the neoplasm grows near the inner commissure of the lower lid, and the skin of half or possibly two thirds of the whole lid has to be removed, together with the conjunctiva and tarsus, we are obliged to undermine the skin below what remains of the lid, as well as all that lies in the district of the long horizontal incision as before. In other words, we undermine the whole region very deeply, so as to get easy shifting of the flap.

The same method can be employed on the upper lid, all that we have to do being to undermine the skin above the long incision when the defect lies at the external canthus. If we desire to cover a defect produced at the inner canthus of the upper lid we undermine upward, freely, to the eyebrows, or even higher up on the forehead.

Taking all in all, it is easy to see how, by various modifica-

tions, we can make use of this method on either upper or lower lid, and at either inner or outer commissure.

The first case operated on by this method was that of a woman of thirty, *with a tumor at the external canthus* of the lower lid. It was removed in the manner suggested, and no trace was left behind, except a defect of the eyelashes over a space 5 *mm* in extent, and in seven years there has been no relapse.

I will here cite very briefly another instance:

Mrs. A., aged fifty-four, had a tumor, covered with offensive discharge, at the inner commissure of the left eye; the lower lid was half involved in the neoplasm, the upper lid entirely. Before the operation it seemed as if the conjunctiva, sclera, and globe were affected by the neoplasm, which the microscope showed us as epitheliomatous. But after denuding the globe, only the conjunctiva and rectus internus were triflingly united with the margins of the lids. Everything that was pathological being removed, a horizontal incision was made as far out as the auricle, and the remaining portions of the lid and skin above this were loosened up above the eyebrows. The skin from the summit of the triangle remaining in the inner angle was likewise undermined, and then a second incision, not far from the auricle and perpendicular to the long incision, was made, and the skin in that region undermined. Then the margins of the incisions in the inner angle of the eyeball could be easily and beautifully adapted to each other. So that, excepting the lower portion of the triangular defect, it seemed as if there had been no reason for the second perpendicular incision, made solely to relieve an apparent tension. A small triangular defect, near the hair, remained after the incisions had cicatrized.

I will here call attention to an operation which gives good results in cases of ectropion. The skin, though interspersed with cicatricial tissue, must possess a consistency that shall insure it from necrosis when freed from its underlying structures. Thin membranous cicatrices after scrofulous ulcerations due to caries, for instance, easily necrose when undermined. This operation consists in making from the inner angle of the orbit, between the nose and the inner

canthus, a few *mm* lower than the latter, a curvilinear incision through the skin of the face. Next the skin is undermined upward toward the margin of the lid until the latter, freed from its cicatricial foundation, can be easily placed in its proper position. In order to replace this flap we push up the skin from below to an amount permitting the removal of the ectropion.

ON CONTINUOUS STERILIZATION FOR KNIVES AND OTHER CUTTING INSTRUMENTS.

By J. A. LIPPINCOTT, M.D., Pittsburgh, Pa.

IN endeavoring to account for the occurrence of panophthalmitis following a smooth cataract extraction last November, I was led to make some experiments in reference to the subject of the sterilization of knives and other sharp-edged instruments. The results of these experiments, which have been continued at spare moments ever since, will be given in this paper as briefly as possible. My assistant, Dr. Joseph L. Duncan, who conscientiously aided me in the work, may publish a more detailed account in the near future.

The aim of the investigation was to arrive at definite conclusions as to the best method of making knives, scissors, cystitomes, etc., surgically clean. My confidence in the efficacy of the plan which I had followed for years, viz., of soaking all cutting instruments in absolute alcohol for half an hour before operating, had been somewhat disturbed by a perusal of Randolph's excellent paper on "Absolute Alcohol as a Disinfectant for Instruments," read before the American Ophthalmological Society, in 1896; but before being "off with the old love" I desired to be thoroughly "on with the new."

It is a matter of common knowledge both in and out of the profession that a temperature approaching the boiling point continued for any length of time impairs the cutting qualities of edged tools. I have frequently heard barbers say that razors were injured by very hot water. This point was properly emphasized by Dr. Randolph during the discussion of Dr. E. A. de Schweinitz's paper on "The Best

Methods of Sterilizing Ophthalmic Instruments and Solutions of Myotics and Mydriatics," read at the last meeting of the American Medical Association, and my experiments show that complete sterilization is not secured by holding an infected knife in a boiling alkaline solution for ten or even twenty seconds. While, therefore, boiling for a sufficient time—ten to fifteen minutes—is possibly the best method of sterilizing non-edged instruments, such as speculum, forceps, spoon, iris repositor, etc., we must resort to other means of obtaining asepsis in the case of cutting instruments.

A perfectly satisfactory method of sterilization for knives, etc., must meet the following requirements: 1st. Freedom from injury to instruments; 2d. Effectiveness.

With reference to the first of these requirements, knives with handles of different materials were exposed for varying periods to the action of a number of antiseptic agents. As a result of these experiments, alcohol was found to be harmless for short exposures (less than twenty-four hours). Prolonged exposure caused rusting. Formaldehyde gas given off by formol in a closed vessel was harmless within an hour or two. When the exposure was continued for twenty-four hours, small whitish spots appeared, which could be wiped off, but left a slightly roughened surface. Forty-eight hours' exposure caused a decided roughening of the blade. On placing a glass bottle containing chloride of calcium in the vessel in addition to the formol, a knife-blade became rusty and covered with a deposit of chloride of iron in a few hours. Bits of copper wire placed in the vessel were covered with a thick deposit of chloride of copper in twenty-four hours.

Formaldehyde gas, produced by burning formaline tablets in the Schering sterilizer, had little if any injurious effect in twenty-four hours; but four knives exposed to this agent for three days in the same receptacle showed numerous and destructive rust spots on the blades.

A moderately strong formol solution turns a polished blade black in two hours and destroys its cutting qualities. I found, however, that by adding 3 per cent. of borax to the

solution the corrosive action of the formol on the blade was entirely prevented. If the handles are of German silver a slight greenish-yellow deposit gradually forms and settles to the bottom of the vessel. In course of time a thin film may be found on the blade, but this can be readily wiped off, leaving a shining surface. Aluminium handles are affected similarly, but to a less degree. Nickel-plated handles show very slight signs of being acted upon, and ivory-handled knives would escape entirely, except for the narrow band of German silver which is generally used to finish the connection between the handle and the blade.

2d. *Effectiveness.*—That the sterilization should be absolute or as nearly so as possible ought to go without saying. With this end in view, about three hundred and fifty culture-tube tests were made of the germicidal potency of the agents already mentioned. The tubes contained nutrient gelatine, carefully prepared. The infecting materials consisted of pus from different sources, including suppurative panophthalmitis, chronic otorrhœa, dacryocystitis, and three cases of severe burn, as well as of cultures from these sources, these cultures being for the most part the result of growth in defiance of one or other of the germicides mentioned above. In addition, some tubes were inoculated from Petri dishes which had been exposed for a few minutes in the general surgical ward of the Allegheny General Hospital. The most resistant of these infecting materials contained a bacillus which I am not bacteriologist enough to designate, but which is still under investigation. It came from one of the burn cases, liquified the gelatine rapidly, and in doing so sank in the form of a dirty white scum to the bottom of the liquid.

These infecting materials were liberally smeared on instruments and short lengths of copper wire. After drying, the infected object was exposed to the influence of the various germicides above mentioned for varying periods, at the end of which the stabs were made as quickly as possible to avoid aerial infection during the transference. The results, or rather such of them as have practical interest, are given below in tabular form.

Germicide.	Time of Exposure.	Number of Tubes	Results.
Abs. alcohol.....	50 minutes or less.	10	Rapid growth in all.
do.	23 hours.	24	6 clear. Rapid growth in 18.
do.	48 hours.	4	Rapid growth in all.
Formaldehyde gas from formol.....	½ to 1 hour.	26	19 clear. Growth in 7.
do.	18 to 24 hours.	17	All clear but one and that probably accidental.
Formaldehyde gas from formol + $CaCl_2$	20 hours.	12	All clear but one.
Formaldehyde gas from Schering's pastilles.....	1 hour.	16	11 clear. Slow growth in 5.
do.	24 hours.	15	11 clear. Growth in 4.
Formol solution 1 to 200, *i.e.*, 1 to 500 formald. gas....	30 minutes.	4	Growth in all.
Formol solution 5 p. c. + borax 3 p. c.....	23 hours.	3	All clear.
do.	44 hours.	13	All clear.
Formol solution 10 p. c. + borax 3 p. c.....	20 minutes or less.	5	Growth in all.
do.	22 hours.	40	35 clear. Growth in 5.
Formol solution 20 p. c. + borax 3 p. c.....	40 minutes or less.	26	Growth in 12.
do.	24 hours.	75	All clear.
do.	47 hours.	6	All clear.

A glance at the foregoing table is sufficient to show, 1st. That alcohol is ineffectual for sterilizing purposes; 2d. That short exposures of infected instruments to the action of formaldehyde gas, whether derived from formol or from formaline pastilles, cannot be trusted; 3d. That twenty-four-hour exposures to formaldehyde gas derived from the pastilles, while retarding do not prevent growth; 4th. That twenty-four-hour exposures to formaldehyde gas given off by formol seem effectual; 5th. That weak solutions of formol will not answer, even a 10 per cent. solution failing in a certain proportion of experiments; 6th. That twenty-four-hour exposures to the action of a 20 per cent. solution of formol containing 2 to 3 per cent. of borax may be confidently relied upon to kill germs.

We have already seen that knife-blades exposed for more than twenty-four hours to the action of formaldehyde gas are more or less corroded. We have also seen that a 20

per cent. solution of formol, containing 3 per cent. of borax, is entirely innocuous, in so far as the blade is concerned. I am at present operating with knives which, except during the few moments of actual use, have been kept continuously in the solution for more than three months, and their cutting qualities are all that could be desired. This method of continuous sterilization has obvious advantages, not the least of which being that the instruments are always ready and that doubts as to their sterility are eliminated. The fluid, if not unnecessarily exposed, retains its potency for months. In seventeen out of the seventy-five tubes which illustrated, without exception, the germicidal power of the solution, the fluid employed had been made in the latter part of December and had been in constant use for over three months at the time of the experiment. It might be well, however, to make assurance doubly sure by adding a small quantity of formol to the solution every three months. A record of such additions could easily be kept on a bit of paper pasted on the jar.

Has the method any drawbacks? Yes. German silver and aluminium handles are slowly acted upon by the fluid, and a fine film may be deposited upon the blade. This should be wiped off with sterile cotton before operating. Ivory handles would be ideal except for the narrow band of German silver which usually finishes off the connection between the blade and the handle. It would be easy enough to have a steel band substituted. German silver handles, when nickel-plated, as mine are, remain practically unchanged, and I need scarcely add that steel handles, like the blades, are entirely unaffected. Furthermore, it would not do to operate with instruments just withdrawn from so irritating an agent as a 20 per cent. solution of formol. Before being used they ought to be rinsed or soaked in sterile water, or a weak borax solution.

This leads me to mention a few practical details of the method. Immediately after each operation the instruments which have been used are wiped with wet cotton and placed in a tray containing a weak borax solution. From this tray, at the end of the operating hour, the edged instruments are

transferred to steel boxes with numerous perforations in the top, bottom, and each end. The boxes are then dropped into a wide-mouthed specimen jar (a common fruit jar answers very well), containing enough of the solution to cover them thoroughly, and here they remain until the next operating day. The jar I use is eight inches wide by nine inches deep, and is kept about two thirds full. The instrument boxes rest on a glass plate, which is supported on four steel legs and which lies two or three inches below the surface of the fluid. The boxes hold as many instruments of each kind as are likely to be used on any one day, because it would be obviously illogical to use an instrument more than once without re-sterilizing.

In preparing for operation, and while cocaine is being applied, the boxes are lifted out of the specimen jar by means of a sterilized hook and suspended for a moment or two to let the fluid drain off. They are then placed in a small tray containing a weak sterile borax solution. From this they are transferred to a larger tray containing some of the same solution, from which they are lifted, when required, by means of the hook, and placed on an aseptic towel. Each instrument before it is used is wiped with a bit of cotton which has been boiled in the weak borax solution. This wiping is for the purpose of removing any film which may possibly have adhered to the blade.

The method described in this paper is applicable in many ways. *E. g.*, my hypodermatic needle (the Detmar and Robinson), which has a steel cylinder and a solid steel piston, is always kept in the fluid when not in use. Suture needles already threaded, the threads being wound on small steel or glass spools, are treated in the same manner.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FOURTH QUARTER OF THE YEAR 1897.

By Dr. ST. BERNHEIMER, in Vienna; and Profs. C. HORSTMANN and P. SILEX, in Berlin;

WITH THE ASSISTANCE OF

Dr. S. M. Burnett, Washington; Dr. Dantone, Rome; Dr. Herrnheiser, Prague; Prof. Hirschmann, Charkow; Dr. P. von Mittelstädt, Metz; Dr. Sulzer, Geneva; Dr. L. Werner, Dublin; Dr. C. H. A. Westhoff, Amsterdam; Dr. Schiötz and Dr. Ole Bull, Christiania; Drs. Greeff and Deus, Berlin; Prof. Da Gama Pinto, Lisbon; and others.

Translated by Dr. Ward A. Holden.

Sections I.–V. Reviewed by Dr. ST. BERNHEIMER.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

TREATISES ON GENERAL, BIBLIOGRAPHICAL, AND HISTORICAL SUBJECTS. STATISTICAL REPORTS.

332. Denti. Clinical report of the ophthalmic department of the Ospedale Maggiore in Milan. *Suppl. al Bollettino della Poliambulanza di Milano*, 1897, 5–6.

333. Gosetti. The ophthalmic division of the Civil Hospital in Venice for the years 1892–1896. *Ann. di Ottalm.*, xxvi., 4, p. 352.

334. Schleich. Rudolf Berlin memorial. *Württembergisches med. Correspondenz-Blatt*, 1897.

335. Transactions Ophth. Soc. of the United Kingdom. Vol. xvii., 1896–1897, pp. 349. London: J. and A. Churchill.

336. KNAPP, H. Twenty-eighth annual report of the New York Ophthalmic and Aural Institute, 1897.

DENTI (332) reports 3578 patients, with 862 operations. There were done 202 cataract operations with 6 per cent. of failures, and 205 iridectomies.

GOSETTI (333) reports on 2818 patients admitted to the hospital, of which 893 suffered from trachoma. Among 157 extractions of senile cataract only 3 were unsuccessful, 1 in consequence of hemorrhage from the choroid. The favorite operation was the small upward-flap extraction with iridectomy, which was done in all but 10 cases. There were performed 162 simple iridectomies, 120 of which were for glaucoma. DANTONE.

This volume (335) contains some very interesting and useful papers, notably the discussion on retro-ocular neuritis (110 pages); tuberculosis of the conjunctiva; hereditary optic atrophy; optic atrophy following head injuries; cases of intra-ocular cysticercus, and microphthalmus with cystic protrusions. The illustrations consist of 4 plates,—those on cysticercus and tuberculosis of conjunctiva being especially praiseworthy,—and 58 wood-cuts.

The Society now consists of 341 members. The President for the present session, 1898–99, is H. R. Swanzy, F.R.C.S., Dublin.

WERNER.

During the hospital year ending September 30, 1897, there were treated at the New York Ophthalmic and Aural Institute (336) 9997 eye cases in the dispensary department, and 435 in the hospital department. There was a total of 587 operations on the eye (excluding the minor), of which 202 were made on the lens. There were 95 simple extractions, and 7 with iridectomy—10 complicated cataracts without iridectomy, and 2 with.

BURNETT.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

337. SSOLOWIEW. On the action of toxins on the eye as compared with the action of pure cultures of staphylococcus aureus and streptococcus. *Dissert.*, St. Petersburg, 1897.

338. HERTEL. Anatomical examination of a case of siderosis bulbi. *Graefe's Archiv*, xliv., 2, p. 283.

339. MÜNDLER. A contribution to the study of the diplococcus lanceolatus in the eye. *Zeigler's Beiträge z. path. Anat. u. allgem. Path.*, xxii., p. 248.

340. GIFFORD. On the use of epithelial lip flaps and half-skin flaps in eye surgery. *Ophth. Record*, Dec., 1897.

SSOLOWIEW (337) experimented on albino rabbits by injecting toxins, filtered off from pure cultures and not sterilized, into the cornea, lens, iris, and vitreous. The filtrates caused in the eye analogous symptoms to those caused by the unfiltered cultures, varying from serous inflammation to the purulent form. The streptococci and their toxins proved to be more virulent than the staphylococci and their toxins. In all cases the pus of the hypopyon remained free from micro-organisms while the membrane of Descemet was intact. The toxins were equally as virulent as the micro-organisms. When either was introduced into the vitreous the inflammatory process brought about never extended to the meninges, the early inflammatory changes in the disk blocking the lymph passages. HIRSCHMANN.

HERTEL (338) reports the detailed anatomical and microchemical examination of a case of siderosis bulbi, undertaken for the purpose of settling certain questions, such, for example, as whether the pathological changes are to be regarded as due to the direct action of the iron, or to an indirect siderosis of all the ocular tissues. He regards all the changes in the cornea, iris, uninjured lens, and retina as the results of a true xenogenous xerosis, caused by the long stay of the iron fragment in the eye; an infectious process is excluded by the course of the disease and the pathological changes found.

MÜNDLER (339) made an anatomical and bacteriological examination of a case of injury of the eye by a twig, in which panophthalmitis followed, and the eye was enucleated on the fourth day. The cause of the inflammation was the diplococcus lanceolatus. Especially interesting were the author's findings in regard to the various staining reactions of the cocci, and the simultaneous appearance of degenerative changes in the cells, which seemed to imply phagocytosis in the sense of Metschnikoff.

GIFFORD (340) has devised a clamp to hold the lip while cutting very thin epithelial flaps from the inside of the lip, for use on the inside of the lids, and on the ball where the conjunctiva is defective. He thinks the mucous flap better than the skin flap, as used by Hotz, as the latter never looses its skin quality and there is always an accumulation of epithelium which is annoying or dangerous.

By half-skin flaps, he means something between a Thiersch graft

and a Wolfe flap, its thickness being about $\frac{1}{16}$ of an inch. He considers these thin flaps superior, for lid operation, to either the Thiersch graft or the flaps without a pedicle. BURNETT.

III.—INSTRUMENTS AND REMEDIES.

341. NEUSCHÜLER. Ophthalmochromoscopy. *Suppl. al Policlinico*, iv., 8, 198.

342. FORTUNATI. Isometropic lenses. *Boll. d. R. Accad. Med. di Roma*, xxii., 4–5.

343. MAGNANI. A contribution to the therapy of spring catarrh. *Clinica Moderna*, iii., p. 51.

344. MASSELON. Holocaine in ophthalmology. *Arch. d' opht.*, xvii., 10, p. 599.

345. PAGENSTECHER. On the use of large doses of iodine in ophthalmological practice. *Klin. Monatsbl. f. Augenheilk.*, xxxi., p. 401.

346. BURNHAM. The hypodermic use of pilocarpine alone, and associated with other medicines, in the treatment of certain eye affections. *Ophth. Review*, xvi., p. 259.

347. SNELL. On the employment of electrolysis as a means of treating granular lids. *Ibid.*, p. 202.

348. HOTZ. Holocaine *vs.* Cocaine. *Jour. Amer. Med. Assoc.*, Nov. 13, 1897.

349. WÜRDEMANN. A report on holocaine as a local anæsthetic in ophthalmic work. *Ophth. Record*, Oct., 1897.

350. FOWLER. Scopolamine hydrobromate as a mydriatic and cycloplegic. *Amer. Jour. of Ophth.*, Nov., 1897.

351. BATES, W. H. Painless eye operations. *N. Y. Med. Jour.*, Oct. 16, 1897.

352. WANDLESS. A new form of intra-ocular iris scissors, and their application in intra-ocular surgery. *Ibid.*, Oct. 23, 1897.

NEUSCHÜLER (341), in a letter from Paris, speaks of Galezowski's attempts to study the fundus with colored lights, in order to determine more exactly the hues. This was done by bringing red, blue, and green lenses behind the mirror. DANTONE.

FORTUNATI (342) speaks of the so-called isometropic lenses, made by Fischer in Paris. A prism of the new Mantois glass was found to have a refractive index of 1.576, while one of crown

glass had an index of 1.528. Lenses of the new glass have certain advantages over those of the old.

MAGNANI (343) has found that cold compresses, diligently applied, speedily lead to improvement in spring catarrh when antiseptic remedies do not give results. DANTONE.

MASSELON (344) found that holocaine, even in 4 per cent. solution, did not produce complete insensibility in inflamed eyes, thus being inferior to cocaine. It did not produce, however, the peculiar effects of cocaine upon the cornea, iris, accommodation, and tension, but its use gave rise to more pain.

v. MITTELSTÄDT.

PAGENSTECHER (345) advises giving very large doses of the iodides, alternating potassium and sodium, in cases of orbital gumma and obstinate episcleritis; 25 grammes a day may be given for three weeks, and will be well borne.

BURNHAM (346) gets good results in rheumatic and specific iritis. He gives pilocarpine for a very long time, several years, with intervals of six weeks or so. Dose, $\frac{1}{12}$ to $\frac{1}{4}$ gr. It is given in the afternoon, patient lying perfectly quiet, on his back, in bed, in flannels, well covered. Patient gets up after two hours, and is rubbed with warm towels. Never had any heart failure or local trouble from injections. WERNER.

HOTZ (348), from his experience with holocaine, finds it quick in its action, but superficial. For cataract extraction he prefers cocaine. BURNETT.

WÜRDEMANN (349) has used holocaine in 1 per cent. solution in all operations on the eye, and has found no ill results. Its advantages are, non-toxic in this dose, aseptic, complete anæsthesia, and non-dilatation of the pupil. It is also cheaper than cocaine.

BURNETT.

FOWLER (350) has used scopolamine in over 600 cases of refraction, and has had no ill effects whatever following it. He uses a twentieth of 1 per cent. solution, applied every fifteen minutes for an hour. He finds the full cycloplegic effect lasts from twenty to thirty hours, and passes off in from seventy to one hundred hours. He has found it useful as a mydriatic in iritis in doses of $\frac{1}{20}$ of 1 per cent. BURNETT.

BATES (351) has found the use of extract of the suprarenal capsule, in conjunction with weak cocaine solution, the best means of securing long-continued and perfect anæsthesia of the eye and the adnexa. The extract of the suprarenal capsule should be

freshly prepared. It acts, he thinks, through its powerful astringent property. Use the extract first and the cocaine afterwards, and then alternate them fifteen minutes apart. He has found this method particularly effective in treating cases of stricture of the nasal duct. It is also useful in advancements.

BURNETT.

WANDLESS (352) has devised a scissors whose blades, when closed, have the form of a sharp lanceolate knife, which can pass readily through the cornea. When in the anterior chamber they can be opened, one blade made to penetrate the iris or other membrane, and cut it in the manner of Wecker's forceps scissors.

BURNETT.

IV.—ANATOMY.

353. TERRIEN. Persistence in man of a vestige of the hyaloid artery in the first months of existence. *Arch. d'opht.*, xvii., 11, p. 695.

354. DEIL. An anatomical explanation of the so-called coloboma of the macula lutea. *Botkin's Hospital-Zeitung*, 1897, No. 45.

355. SATTLER. On the elastic fibres of the sclera, the lamina cribrosa, and the optic nerve. *Arch. f. Anat. u. Physiol.*, 1897, p. 335.

TERRIEN (353) has found regularly in 16 eyes of infants under thirteen months of age, traces of the hyaloid artery, which, it has been supposed, usually disappears before birth. The vessel appears as a thread 1–1.5 *mm* long, arising from the nasal side of the disk and projecting into the vitreous.

V. MITTELSTÄDT.

DEIL (354) examined sections through a coloboma of the macula which he had examined ophthalmoscopically. The coloboma lay 2 disk-diameters from the disk, and was 5 disk-diameters in width. In the region of the coloboma the choroid was completely wanting, being replaced by a sheet of connective tissue like the sclera. The short ciliary arteries after passing through the sclera are surrounded by connective tissue and are lost in masses of wide convoluted vessels about which pigment is deposited. From these vessels tracts of connective tissue pass through the retina and out into the vitreous. The retina covers the entire extent of the coloboma, but at the margins it loses its outer layers. The author believes that in these cases there is

choroidal teleangiectasis with incomplete development of the choroid, for which is substituted a connective-tissue sheet similar to the sclera. HIRSCHMANN.

SATTLER (355) finds the sclera richly provided with elastic fibres which run, in general, parallel to the scleral fibres, but cross one another in all directions. These are not spiral, but straight and undulating. About the scleral foramen they form a ring from which many fibres extend radially into the lamina cribrosa and form a sheath about the central vessels.

V.—PHYSIOLOGY.

356. HOLMGREN. A study of the distortion in a case of partial macropsia. *Nork. med. Arkiv*, Festband, Stockholm, 1897.

357. WIDMARK. On the limits of the visible spectrum. *Konogl. Vetenskaps Akademiens Förhandlingar*, Stockholm, 1897.

358. GULLSTRAND. Photographic-ophthalmometric and clinical investigations on the refraction of the cornea. *Ibid.*, xviii., No. 7, 1896.

359. PARINAUD. Functional relations of the two eyes: simultaneous, binocular, and alternating vision. *Ann. d'ocul.*, Sept., Oct., and Nov., 1897.

360. PARENGO. An attempt at a comparative study of the ability of normal eyes to recognize colors. *Dissert.*, St. Petersburg, 1897.

361. HEINE, L. The accommodative movement of the lens measured subjectively and objectively. *Graefe's Archiv*, xliv., 2, p. 299.

362. KOSTER. A criticism of Schapringer's paper entitled, "Does not perception of the various colors take place in one and the same layer of the retina?" *Graefe's Archiv*, xliv., 2, p. 250.

363. PICKEMA. On acuteness of vision with different illuminations. *Inaug. Dissert.*, Utrecht, 1897.

364. PLANTEGNA. The depth of the anterior chamber with different states of refraction and at different ages. *Geneesk. Tydschrift*, 1, p. 360, 1898.

365. KOSTER. The discussion in regard to the mechanism of accommodation. *Ibid.*, p. 81.

366. JACKSON. Auto-skiascopy. *Ophth. Review*, xvi., p. 227.

367. WILLIAMS. Standards of form and color vision required in railway service. *Trans. Amer. Ophth. Soc.*, 1897.

368. THORINGTON. Lenses for the study of the scissors movement, conic cornea, and spheric aberration with the retinoscope. *Jour. Amer. Med. Assoc.*, Dec. 18, 1897.

HOLMGREN (356) has suffered from a relative central scotoma in his right eye, coming on from dazzling with light in 1880. In the region of the scotoma he has macropsia, metamorphopsia, and a certain degree of red blindness. By fixing a rectangular object with each eye he was able to determine the degree of the macropsia. With small objects the increase in apparent size was considerable, with larger objects it was less, and with objects of a certain size there was no apparent enlargement. This size corresponded in extent to the scotoma formed. SCHIÖTZ.

WIDMARK (357) has made a series of experiments with a grating spectroscope in order to determine the sensibility of the retina for the ultraviolet rays. He finds the following. The normal human eye perceives only a small portion of the ultraviolet rays. The limit of the visible spectrum varies with different individuals, but usually lies within L–M. The rays are perceived directly, and not through fluorescence. Older persons recognize fewer of the ultraviolet rays than younger. This is especially noticeable in persons over sixty-five. The lens is the chief factor in preventing the visibility of the extreme rays, and after its removal the violet end of the visible spectrum is considerably elongated. SCHIÖTZ.

GULLSTRAND (358) describes the previous researches of Leroy, Sulzer, and Eriksen on the same subject. In order to obtain the greatest possible accuracy he has arranged an apparatus by means of which he obtains a photograph of the corneal image reflected from a disk with concentric rings. He then measured the rings in the photograph, and computed the radius of curvature of the cornea at various points. For clinical work he devised a disk with a quadrangular figure having its sides so curved that its reflection in a convex mirror formed a square. The results of examining a number of eyes are given, and different types of asymmetry are described. SCHIÖTZ.

PARINAUD (359) regards the visual apparatus as a reflex arc composed of a motor and a sensory apparatus. Seeing with two eyes implies three sorts of reflex connections: one between the two retinas providing for their association; a second between

the various motor centres providing for the motor association; and a third connecting the sensory apparatus with the motor. The ocular movements which are brought about by these reflexes may be divided into four categories: 1. Associated lateral movements; 2. Associated convergence movements; 3. Pupillary movements; and 4. The accommodative act. The first can be produced from any point in the visual field; the second, third, and fourth only from its centre. SULZER.

PARENGO (360) examined the eyes of 400 sailors with the spectroscope at different times on a long voyage, and found that the limits of color perception are not constant. The acuteness of color perception increases with light exercise after rest, and diminishes with fatigue and after eating. The right eye distinguishes colors better than the left.

HEINE (361), Hess's assistant, has continued the latter's experiments on accommodation, and by new methods has arrived at the same results. He finds that with maximum accommodation the lens sinks by gravity $\frac{1}{4}$ *mm*, and when eserine is used it sinks $\frac{1}{2}$ *mm*. Thus, when the head is inclined 90% to the right, and then 90% to the left, during accommodation, the lens may undergo $\frac{1}{2}$ *mm* displacement, and if eserine has been used 1 *mm*.

According to PICKEMA (363), differences in daylight, so long as the illumination is not less than 10 candle-power, have little effect on the distinguishing power. It does not matter whether the illumination is 30 or 50 candle-power. For the workshop 10 candle-power should be the minimum; for finer work 15–20 candle-power should be the minimum.

PLANTEGNA (364) used in his investigations a Javal-Kagenaar ophthalmometer, and an ophthalmo-microscope corresponding in the main with that of Donders and Horstmann. He found an average radius of curvature in emmetropia of 8.12 *mm*, in myopia of 8.13, and in hyperopia of 8.29 *mm*. Donders found 7.93 *mm* in 20 young persons. Mauthner, in E., 7.708; in M., 7.584; and in H., 7.623. Horstmann, in E., 7.78; in M., 7.78; and in H., 7.91. The curvature of the cornea is almost the same in emmetropia and myopia, and greater in hyperopia. The depth of the anterior chamber is, in E., 3.036 *mm*; in M., 3.267 *mm*; in H., 2.865 *mm*; and the average is 3.056 *mm*. In emmetropes between forty and fifty, the average depth is 2.95 *mm*; in emmetropes over sixty years, 2.61. The depth of the anterior chamber decreases with age. WESTHOFF.

This is a useful procedure for studying skiascopy. JACKSON (366) uses an ordinary looking-glass in which the person sees his own reflected image. The observing eye is used to study the refraction of the other. The light is placed on the side of the observing eye, but so as to be shut off from the observed eye by the bridge of the nose. The movements of the shadow are the same as usual. This method is easy of application. The refraction is really estimated at a point a little to the temporal side of the macula. WERNER.

WILLIAMS (367) gives an elaborate consideration of the subject of form and color vision required by railway service. Form defect is more common than color defect in the proportion of 344 to 176. He would have a standard for class "A"—engine drivers and firemen—$\frac{20}{20}$ in both eyes in the former, and not less than $\frac{20}{40}$ in the latter, and H. of not more than 2 + after years of service. For class B, $\frac{20}{20}$ in one, and not less than $\frac{20}{40}$ in the other. He uses Snellen's types, but has several different sets so that they cannot be learned by heart. For testing color vision he uses Holmgren's method—flags and the colored lights. For the last he has devised a large disk with a number of smaller disks on the periphery, which can be brought behind a perforation, in front of which another disk, with various-sized openings, can be brought, in order to test the smallest-sized color space that can be distinguished. BURNETT.

THORINGTON (368) has conceived an addition to his schematic eye whereby can be demonstrated the phenomena of "scissors movement," conical cornea, and spherical aberration in skiascopy. The first consists in a concave lens with a section of a convex lens of double the strength fitted so as to occupy only one half of its area, the edge of the additional lens reaching the centre of the pupil. Conical cornea is represented by a very small convex lens cemented on a plane glass, and spherical aberration by a small cavity hollowed out of a plane glass. These are fitted on the front of the schematic eye for experiment. BURNETT.

Sections VI.–XI. Reviewed by PROF. HORSTMANN.

VI.—ANOMALIES OF REFRACTION AND ACCOMMODATION.

369. FROMAGET and BORDIER. Studies on acuteness of vision and amplitude of accommodation. *Arch. d'opht.*, xvii., 10, p. 601.

370. EXAMINATION OF THE EYES OF SCHOOL-CHILDREN IN

REICHENBERG. *Sanitary Report of the Town for 1896.* (Statistics of refraction.)

371. LASCHTSCHENKO. The 7th semester students of the medical faculty in Charkow. *Wjest. Obscht. Hygieng i Medic.*, Oct., 1897.

372. DESPAGNET. Astigmatism of 14 dioptries without conical cornea. *Soc. d'opht. de Paris*, 1897, No. 7.

373. SCHIÖTZ. A case of spasm of accommodation. *Norsk. Mag. f. Laeg.*, 1897, No. 5, p. 565.

FROMAGET and BORDIER (369) give the results of the determination of vision in 900 school-children, between five and twenty-one years of age. In 408 cases the amount of accommodation was also determined, in its relation to the refraction. Curves are given, showing the relation of accommodation to the state of refraction at various ages. Similar studies were made on soldiers from twenty-one to twenty-five years of age.

SCHIÖTZ's (373) patient was a girl of ten, who had become myopic, and who suffered from weekly attacks of headache, with congestion and an eruption about the eyes. She wore −4 D. With −8 or 9 D, V = $\frac{20}{40}$ each; fundus normal. The attacks of headache always came on in the afternoon, beginning with pain about one or both eyes, gradually extending over the corresponding side of the head. At the same time the skin of the eyelids and neighboring parts became red and swollen; fever and a feeling of malaise came on, and the patient was obliged to go to bed. By the next morning the attack had always passed off, but on the lids there was an eruption of small vesicles which soon dried. The affection was regarded as one of masked malaria, and quinine and change of residence were ordered. The attacks ceased at once and the myopia gradually decreased, so that after a month she left off her glasses, and when examined, four months later, her eyes were found to be emmetropic, with vision $\frac{20}{20}$. The myopia was thus due to spasm of accommodation.

SCHIÖTZ.

VII.—LIDS.

374. PES. Microchemical researches on the secretion of the palpebral sebaceous glands. *Arch. di Ottalm.*, v., 3–4, p. 82.

375. WALDHAUER. On the operation for trichiasis of high degree. *Klin. Monatsbl. f. Augenheilk.*, xxxiv., p. 377.

376. SIROTKIN. Modification of Panas's entropium operation and the Flarer operation. *Wjest. Ophth.*, xvi., 6, p. 538.

377. KUSCHEW. A new operation for ectropium. *Ibid.*, p. 544.

378. STRSCHEMINSKY. Restitution of the lid margin in entropium and trichiasis. *Wratsch*, 1897, No. 12.

379. HIRSCHFELD. Some remarks on plastic operations on the lids. *Klin. Monatsbl. f. Augenheilk.*, xxxiv., p. 435.

380. PARINAUD. A new ptosis operation. *Ann. d'ocul.*, cxviii., p. 13.

381. SCALINCI. Cicatricial cryptophthalmus from combustion. Clinical note. *Lav. d. clin. ocul. d. R. Univ. di Napoli*, v., 2, p. 96.

382. BRUNS. Epithelial horn at temporal edge of upper lid. *Amer. Jour. of Ophth.*, Dec., 1897.

PES (374) examined microscopically the secretion of the Meibomian glands with various chemical reactions, and he concludes that the chief constituent is cholestrin. This is saponified by the alkaline tears and is washed away. With excessive secretion it remains as a white, foamy mass on the lid margins.

DANTONE.

In the higher grades of trichiasis of the lower lid, WALDHAUER (375) makes an incision from the outer angle of the orbit to the point of emergence of the infra-orbital nerve. A narrow crescentic strip of skin is removed, and the wound closed with a continuous suture, including the margin of the tarsus.

SIROTKIN (376) operates for entropium of the upper lid as follows: An incision is made 2–3 *mm* above the free margin of the lid, and some muscle tissue is removed and also a strip 1–2 *mm* broad of the lower edge of the tarsus. The sutures are then passed through the skin, muscle, and fascia, but not through the tarsus. HIRSCHMANN.

KUSCHEW (377) makes an intermarginal incision 2–3 *mm* deep, and two incisions through the skin 2–3 *mm* apart. The two skin strips are then transposed and fixed with sutures.

HIRSCHMANN.

STRSCHEMINSKY (378) transplants four or five small bits of the mucosa of the lip into the intermarginal incision. These small flaps need not be sutured. HIRSCHMANN.

PARINAUD (380) recommends the following procedure in ptosis

operations: A loop of thread is passed beneath the superior rectus muscle. The needles on its two ends are then passed on either side of the superior rectus into the retrotarsal fold, and carried down between the tarsus and the skin of the lid to the ciliary margin. The sutures are brought out 7–8 *mm* apart, and are allowed to remain 4–6 days. SULZER.

In BRUNS's (382) patient, an Italian of thirty-five years, there was an epithelial horn ½ of an inch long and ¼ inch at its base, tapering to a point, springing from the skin just above the eyelashes of the outer edge of the upper lid. It was removed by scissors, and there was no return. BURNETT.

VIII.—LACHRYMAL APPARATUS.

383. DE WECKER. On the efficacy of ablation of the palpebral lachrymal gland. *Prog. méd.*, 1897, No. 47, p. 393.

384. GALLENGA. On the principal congenital alterations in the lachrymal caruncle, with some notes on its structure and development. *Arch. di Ottalm.*, v., 1–2, p. 1.

385. HORMANN. On the use of permanent sounds in diseases of the lachrymal duct. *Zehender's klin. Monatsbl.*, xxxiv., p. 427.

386. SILVESTRI. Sarcoma of the lachrymal sac. *Ann. di Ottalm.*, xxvi., 5, p. 452.

387. KYLE. Operation intended as a substitute for extirpation of lachrymal gland or duct. *Amer. Jour. of Oph.*, Dec., 1897.

388. EYRE. The etiology of dacryocystitis. *Ophth. Record*, Nov., 1897.

389. OLIVER. Resection and advancement of the levator palpebræ muscle in traumatic ptosis. *Trans. Amer. Ophth. Soc.*, 1897.

390. KOLLOCK. A case of strabismus in a full-blooded negro. *Ophth. Record*, Dec., 1897.

HORMANN (385) advises the use, in diseases of the lachrymal duct, of silver-wire sounds bent at the end to prevent them from slipping down into the duct. The use of these sounds has been recommended by Schweigger, Vulpius, and Silex, and they are left in position for months.

The late SILVESTRI (386) observed a case of tumor of the right lachrymal sac which at first resembled an ordinary abscess, but

which was later diagnosed as sarcoma, and this diagnosis was confirmed by microscopic examination after excision. There were several recurrences in the direction of the orbit, and later a large tumor appeared in the parotid region. The later history of the case was unknown. DANTONE.

The operation proposed by KYLE (387) is to perforate the thin wall separating the inner lining of the lachrymal sac and the nose, and introducing a short canula, which is to remain more or less permanently. He says there is but little hemorrhage, and that the new canal is easily kept patent. BURNETT.

From a number of examinations of the secretion from inflamed tear sacs, EYRE (388) concludes that no one organism is found constantly in ordinary mucocele. He has found a bacillus which he thinks the same as that described by Weeks, the staphy. pyog. aur. and alb., and the xerosis bacillus. In the suppurative forms, acute and chronic, he found the streptococcus pyog. longus. invariably present. BURNETT.

In the case reported by OLIVER (389) a scissors blade was thrust through the lower lid into the lower cul-de-sac, across the cornea into the upper cul-de-sac, and through the upper lid, dividing the levator palpebræ muscle. There was complete ptosis and much cicatricial contraction of the conjunctival sac. The levator was carefully dissected from the mass of cicatricial tissue, and united to the upper edge of the tarsus. There was a complete hernia of conjunctiva through the palpebral opening following this. This was replaced and sutured to the lid. There was then good movement of the eyeball and lid. A severe suppurative keratitis followed, but was successfully combated, and there is now a useful eye. BURNETT.

KOLLOCK (390) figures a case of very strong convergent strabismus (concomitant) in a full-blooded negro. There were 2 D of H. and V = $\frac{8}{10}$ in each eye. BURNETT.

IX.—MUSCLES AND NERVES.

391. VIGNES. On the comparative value of operative procedures in muscular asthenopia. *Ann. d'ocul.*, cxviii., p. 292.

392. MINGAZZINI. Recurrent paralyses of the oculo-motor nerve. *Società Dante Alighieri*, Rome, 1897.

393. MINGAZZINI. A contribution to the study of alternating paralyses of the ocular muscles. *Suppl. al Policlinico*, iv., 1897.

MINGAZZINI (392) describes in detail all the symptoms of periodic paralysis of the oculo-motor nerve, and carefully compares the symptom-complex of the fifty-nine cases already reported. He considers the designation, "recurrent oculo-motor paralysis," as the most fitting name for this affection.

DANTONE.

MINGAZZINI (393) reports on two further cases of periodic disturbance of ocular motility in which, besides the branches of the oculo-motor, those of the superior oblique and external rectus were involved. DANTONE.

X.—ORBIT AND NEIGHBORING CAVITIES.

394. BANBY, DENIS. Orbital complications of pyæmia of the maxillary sinus. *Ann. d'ocul.*, cxviii., p. 214.

395. ABADIE. The nature and treatment of exophthalmic goître. *Ibid.*, p. 41.

396. JABOULSY. Treatment of exophthalmic goître by section or resection of the cervical sympathetic. *Ibid.*, p. 121.

397. PÊAU. Surgical treatment of exophthalmic goître. *Rec. d'opht.*, 1897, 10, p. 561.

398. RECLUS and FAURE. Bilateral resection of the cervical sympathetic in exophthalmic goître. *Ann. d'ocul.*, cxviii., p. 3.

399. DOYEN. Excision of the thyroid in exophthalmic goître. *Ibid.*, p. 123.

400. CLARKE, T. F. The etiology, prognosis, and treatment of exophthalmic goître. *Amer. Jour. of Ophth.*, Nov., 1897.

In a man of seventy-one, BANBY (394) saw a phlegmon of the orbit suddenly develop in the course of a chronic inflammation of the antrum with swelling of the lower lid and cheek. An incision showed that the phlegmon proceeded from an ostitis of the floor of the orbit due to the affection of the antrum. After a thorough cleaning out of the cavities, the patient did well until he was attacked with broncho-pneumonia and died.

In a second case, a laborer of twenty-eight with carious upper teeth and signs of chronic antrum disease, an inflammatory exophthalmus developed. An operation showed that the floor, together with the outer and inner walls of the orbit, were necrotic. After a thorough operation the local conditions improved, but later the patient died of an abscess of the frontal lobe which had

developed from a circumscribed necrotic spot in the roof of the orbit. The pneumococcus was found in the pus. In both these cases the veins and lymphatics were not affected, the extension being directly through the bone.

V. MITTELSTÄDT.

XI.—CONJUNCTIVA, CORNEA, SCLERA, AND ANTERIOR CHAMBER.

400A. LEBER. On the treatment of gonorrhœal conjunctivitis in adults by means of Kalt's method of irrigation with weak solutions of permanganate of potassium. *German Ophth. Soc. Report*, 26th Meeting, 1897, p. 249.

401. PICK, L. On the histology of trachoma. *Graefe's Archiv*, xliv., 3, p. 614.

402. MÜLLER. On the bacteriology of trachoma. (Preliminary communication.) *Wiener klin. Wochenschr.*, 1897, No. 42.

403. NYEL. Subconjunctival cysticercus. *Ann. d'ocul.*, cxviii., p. 112.

404. FEHR. Angioma of the bulbar conjunctiva. *Graefe's Archiv*, xliv., p. 614.

405. SILCOCK. Pemphigus, or essential shrinking of the conjunctiva. *Trans. Ophth. Soc. Un. K.*, xvi., p. 1.

406. EYRE. Tuberculosis of the conjunctiva. *Ibid.*, p. 8.

407. HARLAN, HERBERT. A case of chronic pseudo-membranous conjunctivitis, with development of ocular and pharyngeal diphtheria, on the use of jequirity. *Jour. of Eye, Ear, and Throat Diseases*, Oct., 1897.

408. HOWE. Crede's method for the prevention of purulent ophthalmia of infancy in public institutions. *Trans. Amer. Ophth. Soc.*, 1897.

409. BRUNS. Diphtheritic conjunctivitis. *Amer. Jour. of Ophth.*, Dec., 1897.

In gonorrhœal ophthalmia in adults, LEBER (400A) has used successfully Kalt's method of washing out the conjunctival sac three or four times daily with great quantities of a weak solution of permanganate of potassium. In blennorrhœa of the new-born, he prefers the old method of treating the conjunctiva with 2–3 per cent. silver solution.

After studying 57 bits of excised trachomatous tissue, PICK (401) described the epithelial changes, the histology of the follicles, the changes in the other conjunctival tissues, and the secondary changes in neighboring parts.

MULLER (402) has cultivated from the conjunctival secretion of trachoma a bacillus morphologically, and in its cultures, analogous to the influenza bacillus. It is a thin rod, growing only in media prepared with blood.

SILCOCK'S (405) patient, a girl æt. eight years, exhibited shrinking and scarring of the conjunctiva, with corneal ulceration; nearly a year later, bullæ formed on the feet, forearms, and face. An interesting account of the bacteriology of pemphigus is given by Mr. Plimmer, who found in this case micrococci corresponding in all respects with those described by Demme in 1886; they often occurred as diplococci, a little larger than gonococci; stain well with basic aniline colors and densely by Gram's method.

WERNER.

EYRE'S (406) paper contains descriptions of eight cases, with four colored illustrations of different forms of the disease, and a useful bibliography of cases published subsequent to Koch's discovery of the bacillus tuberculosis in 1882. The author's cases are grouped according to Sattler's plan: 1. Miliary ulcers, chiefly palpebral, one case. 2. Grayish-yellow subconjunctival nodules, not unlike sago grains, two cases. 3. Florid hypertrophied papillæ and rounded outgrowths from fornices, two cases. 4. "Lupus" of the conjunctiva, with cockscomb-like excrescences, of a jelly-like consistency, one case. One other group is added, characterized by the existence of distinct pedunculated tumors, like papillomata, or polypi, in appearance. The tubercle bacilli can be generally found in groups 1, 2, and 5. In group 3 they cannot, as a rule, be found, and the author was unable to detect them in the conjunctival secretion in these cases. Local infection is invariably the cause in groups 1, 2, and 5. The ages of the patients vary from ten months to thirty years. The palpebral conjunctiva is more often affected than the bulbar. Occasionally there is keratitis and iritis. The pre-auricular gland is generally enlarged. Inoculation experiments gave positive results, even where no bacilli were found.

WERNER.

HARLAN (407) reports a case of chronic membranous conjunctivitis limited to one eye. It was removed by cautery and all sorts of caustics, but invariably returned. Finally jequirity was ap-

plied and this was followed by a genuine diphtheritic exudation in the eye, nose, and pharynx. The first exudate did not show the Klebs-Loeffler bacillus. The membrane on the conjunctiva persisted after the disappearance of the diphtheritic inflammation. BURNETT.

In this paper HOWE (408) again makes a strong plea for legislation compelling the use of Crede's method in public institutions, producing statistics showing how, by this means, the disease can be practically wiped out. A committee was appointed by the Society, of which Dr. Howe was made chairman, to report on the subject at the next meeting of the Society. BURNETT.

BRUNS (409) reports three cases of membranous conjunctivitis of a mild type in which the Klebs-Loeffler bacillus was found in abundance. BURNETT.

410. ANDREJEW. On the source of the hypopyon in keratitis. *Inaug. Dissert.*, St. Petersburg, 1897.

411. ROHMER. On purse-string suture of the conjunctiva in solutions of continuity of the cornea. *Ann. d'ocul.*, cxviii., p. 321.

412. GEIRSVALD. Carbolic acid for corneal ulcers. *Norsk. Mag. f. Laeger*, 1897, No. 5, p. 569.

413. KOHL. On the pathology and therapy of ulcus serpens. *Inaug. Dissert.*, Giessen, 1897.

414. PETRASCO. On a peculiar form of keratitis. *Wiener med. Presse*, 1897, No. 43.

415. LEBER. On ribbon-shaped keratitis. *Heidelberg Ophth. Soc. Report for 1897*, p. 53.

416. STEINHEIM. On congenital staphyloma of the cornea. *Centralbl. f. prakt. Augenheilk.*, xxi., p. 353.

417. GINSBERG. A case of intracorneal retraction cyst in a chicken. *Ibid.*, p. 359.

418. DE WECKER. On optical tattooing of the cornea. *Ann. d'ocul.*, cxviii., p. 88.

419. LANGIE. On the tattooing of opacities of the cornea for improving vision. *Rec. d'opht.*, 1897, No. 9, p. 515.

420. SANDFORD. Note on the application of oxygen to suppurative conditions of the cornea. *Trans. Ophth. Soc. Un. K.*, xvii., p. 25.

421. COLLINS, E. T., and STOKER, GEORGE. Ulcer of cornea

with extensive purulent infiltration; treatment with oxygen only; recovery. *Ibid.*

422. De Schweinitz. Absorption of the pigment after blood-staining of the cornea. *Ophth. Record*, Dec., 1897.

423. Harlan, G. C. Trophic keratitis with a case occurring in caisson disease. *Trans. Amer. Ophth. Soc.*, 1897.

Andrejew (410) inoculated the corneas of rabbits with cultures of staphylococcus aureus and obtained hypopyon keratitis, varying in severity with the quantity and virulence of the inoculated micro-organisms. The leucocytes, composing the hypopyon, came from the region of Schlemm's canal and from the iris. Neither micro-organisms nor leucocytes pass through the intact membrane of Descemet. Hirschmann.

Geirsvald (412) in hypopyon keratitis recommends the cauterization of the ulcer with pure carbolic acid applied with a Bowman probe, one application daily for three days usually being sufficient. In twelve cases, some complicated with blennorrhœa of the tear sac, this treatment was so efficacious that in no case was the Saemisch operation, subconjunctival injection, or the thermo-cautery required. Schiötz.

Kohl (413) states that in cases of small serpent ulcer the treatment should be atropine, and moist or dry hot applications with a pressure bandage. If the ulcer progresses the advancing margin should be cauterized, and if the hypopyon is excessive the anterior chamber should be punctured below. If the process is very severe, the Saemisch operation should be done, alone or in conjunction with cauterization.

Steinheim (416), among five children in a family with healthy parents, observed congenital staphyloma of the cornea in three and a marked opacity of the cornea in another.

In both these cases good results followed the application of oxygen as adopted by Dr. Stoker (421) for ulcers in other parts of the body. The gas is applied from a rubber bag by means of a cap over the eyes which can be worn during the day; the apparatus is very light and portable. The unfavorable bacteria disappeared under this treatment. A cubic foot of gas, sufficient for twenty-four hours, only costs $2\frac{1}{2}$ *d.* Werner.

De Schweinitz (422) reports the further history of a case of blood-staining of the cornea, showing that in time the effused blood may be all absorbed, though it may take one or two years. Burnett.

HARLAN'S (423) case is one of keratitis of a purulent destructive form associated with anæsthesia of the parts of the face supplied by the ophthalmic and sup. maxillary branches of the fifth nerve. The man had been working in a caisson and was suffering with the symptoms usually observed in those working under high atmospheric pressure. BURNETT.

424. LAGRANGE. An epibulbar epithelial tumor. Recurrence and involvement of the upper lid. *Arch. d'opht.*, xvii., 12, p. 763.

425. DE LAPERSONNE. On a sarcomatous tumor of the sclero-corneal junction. *Ibid.*, p. 757.

LAGRANGE'S (424) patient was a woman of thirty-four, from whom had been removed a slow-growing epithelioma lying between the inner corneal margin and the inner canthus. The growth returned in a year, involving the upper lid so that the ball and a portion of the orbital contents had to be removed. Examination showed that the ball was intact, the sclera having withstood the extension of the growth, as it ordinarily does except when the region of the sclero-corneal junction is involved, when the growth follows the vessels and often penetrates the ball. v. MITTELSTÄDT.

DE LAPERSONNE (425) removed from the corneal limbus of a man sixty years of age a tumor $\frac{3}{4}$ *mm* high and 13 *mm* broad which had grown rapidly. At first glance it appeared to be a mixed epithelioma and sarcoma. A careful examination by Curtis, however, showed that the alveoli between the tracts of sarcoma elements were filled not with epithelium but with endothelium. v. MITTELSTÄDT.

REPORT OF THE TRANSACTIONS OF THE SECTION OF OPHTHALMOLOGY AND OTOLOGY AT THE NEW YORK ACADEMY OF MEDICINE.

OPHTHALMOLOGICAL PART OF THE MEETING OF APRIL 18, 1898.

By Dr. W. B. MARPLE, Secretary.

The President, Dr. E. GRUENING, in the Chair.

The evening was devoted entirely to the presentation of clinical material—cases and specimens.

Dr. CHARLES STEDMAN BULL reported a case of **cysticercus cyst** of the lid. The patient was an Italian boy aged six, first seen February 14, 1897. There was a small tumor in the subcutaneous cellular tissue just below the lower lid on the right side, about as large as a filbert, smooth, non-lobulated, painless, and elastic, looking like an ordinary fatty tumor. Skin freely movable over it. Tumor had been noticed about three months, and had never occasioned any inconvenience. Removed without any difficulty by an incision about an inch long, which healed completely in twenty-four hours. Tumor shelled out of its bed like a pea out of its pod. The entire interest centres in the microscopical examination, which was made by Dr. George S. Dixon, one of the pathologists of the Eye Infirmary. Owing to the confusion existing among helminthologists as to the early cysticercus stages of Tænia solium and T. echinococcus, it is difficult to reach a definite conclusion. The scolex was single; the hooklets perfectly formed, corresponding more nearly to Cysticercus cellulosæ. The suction disks are prominent.

The specimen was discussed by Drs. G. S. DIXON and J. E. WEEKS. The latter referred to the rarity of echinococcus cyst, and said, further, that the relatively small size of the cyst in Dr. Bull's case made it more probable that it was cysticercus. Grow-

ing for the same length of time, it would probably have been larger if it had been echinococcus.

Dr. H. KNAPP presented several patients to illustrate the three classes of keratitis originating in the three anatomically distinguishable strata of the cornea—the conjunctival, the uveal, and the scleral or intermediate. The first case showed what v. Graefe called a dense and extensive **torpid infiltration in the intermediate layers of the cornea,** unconnected with the formation of blood-vessels, and spreading over a good part of the cornea, lasting several months, and finally clearing up. He had used subconjunctival injections of sublimate. The result was not brilliant, and the reaction was too violent. He employed a 1 : 5000 solution, and injected 2–3 ♏. He wished to know the experience of others present in similar conditions, especially whether any form of treatment produced a quicker cure. June 18, 1898, the eye had cleared almost completely. About 10 subconjunctival injections were made. Never was there a blood-vessel to be discovered, nor congestion of the iris.

Dr. D. WEBSTER would have called it interstitial keratitis, and would have treated it with subconjunctival injections of sublimate twice a week. Thinks they get well quicker under this form of treatment. He employs a 1 : 1000 solution, and injected at first 5–6 minims, but there was too much reaction. His present practice is, after cocainizing the eye, to inject enough (possibly 2–3 minims) beneath the conjunctiva to produce a little bleb, and then to employ massage. Sometimes the redness remained for a week.

The CHAIRMAN referred to a paper read by Chibret two or three years ago on the subconjunctival injection of sublimate, and also said that massage through the lids was of great benefit in these cases.

Dr. H. KNAPP then showed a case of **superficial infiltrated ulcer** of the cornea, and referred to his treatment in these cases, serpent ulcer, etc. In the milder ones he anæsthetizes with holocain, and then sterilizes with tinct. iodine or nitrate of silver. When there was hypopyon with circumscribed infiltration of cornea, he immediately burned it out with the galvano-cautery. It gave the quickest healing and the smallest scars. In advanced cases he resorted to Sämisch's keratotomy. Where there was corneal abscess, hypopyon, and increased tension, iridectomy has given him surprisingly good results.

Dr. CHAS. S. BULL said that his practice in these ulcers was to thoroughly curette, and then apply the galvano-cautery. He had been entirely satisfied with his results.

Dr. T. R. POOLEY thought that tinct. iodine was about as worthless a remedy as we could use in these cases. As to use of the galvano-cautery, he could agree with Dr. Knapp. But in ulcus corneæ rodens cauterization does not seem to influence the condition. It usually goes over the whole cornea. The opacities are not apt to be dense, however, and expectant treatment is better.

Dr. W. B. MARPLE said that while tinct. iodine is more or less uncertain, still it is, in many cases, undoubtedly of great benefit. In Dr. Gruening's clinic the past winter he had employed it with benefit in several cases of severe ulcer of the cornea. In two cases there was hypopyon, and improvement began at once after the daily application of tinct. iodine. In one case similar to the others it seemed to be entirely inefficient.

The CHAIRMAN spoke of the keratitis dendritica of Hansen Grut. He scrapes the affected area, and irrigates with a couple of ounces of a $\frac{1}{4}$ per cent. solution of nitrate of silver in an Undine. A yellowish incrustation, lasting some time, is left. He then uses a solution of *nitrate* of cocaine (instead of the muriate), and has had no incrustation since. He sometimes employs a 1 per cent. solution of nitrate of silver, and this he rubs in with a tuft of cotton on an applicator or wooden toothpick.

Dr. KNAPP agrees with Dr. Bull as to efficacy of galvano-cautery, but sometimes this seems formidable to the patient, and simpler remedies have to be resorted to.

Dr. H. KNAPP showed a third case, **keratitis profunda,** with other symptoms and a clear history of hereditary specific disease. The patient was presented merely as a typical example, illustrating that the heredito-specific, parenchymatous keratitis is an affection of the uveal tract, of which, as is well known, the deep layers of the cornea are an extension. The radiating blood-vessel, derived from the ciliary body, emerging abruptly at the transparent margin of the cornea, and having no connection with the anterior vessels, could be very clearly seen.

The fourth case presented by Dr. KNAPP offered a very remarkable picture, viz., **white, semi-transparent keratoglobus in both eyes.** The patient, a woman about forty-five years old, free from specific disease, had been under his care for

eighteen months. When first seen, she suffered from sclero-uveitis anterior. The cornea was hazy, the iris dull and swollen, circular synechiæ, background not visible. Atropine, alteratives, salicylates, rest, and great care did not prevent the steady progress of the disease. The cornea became dull-white, like frosted glass, through which the iris and pupil could barely be distinguished. The eyeballs became somewhat enlarged and the cornea globular, as you still see them. The eyeballs hardened. I made an upward iridectomy on the right, the worse eye. There was a good deal of reaction, and sight became worse. I did not make an iridectomy on the other eye, and instilled pilocarpine in both. The plus tension has continued in the left, but gradually disappeared in the right eye, which is slowly returning to its natural size, its cornea is clearing somewhat, and she counts fingers at three feet, whereas with the other she sees only movements of the hand. As long as I have watched her case, the iris was uneven, irregularly nodular. The whole picture comes nearest to that of inoculation tuberculosis in rabbits. I have considered the disease tubercular, have given her good food and cod-liver oil. I shall make an iridectomy on the left eye.

Dr. W. B. MARPLE presented a case of **functional ophthalmoplegia.** He said that he was very glad to acknowledge his entire indebtedness to his friend, Dr. B. Sachs, for discovering most of the interesting and characteristic features of the case. For this he wished to thank him, as well as for his kindness in being present to-night, and demonstrating these features for the benefit of the Section. Dr. Marple said that the patient presented himself in his clinic in January, complaining of diplopia, which was found to be due apparently to a paresis of the left external rectus. He then asked Dr. Sachs to examine him, with a view of finding out whether any other neurological symptoms were present. He would ask Dr. S. to continue.

Dr. SACHS said the patient was fifty-one years of age, a heavy drinker, with a doubtful history of specific infection. About seven years ago he lost his wife, who is said to have had an eye trouble similar to the patient's. She died in an apoplectic seizure. On the 12th of January the patient attended the funeral of a friend, when, while standing on the sidewalk, he felt a flash of light, began to see double, and could not look at the light. On the first examination, about five weeks ago, I found an apparent double ptosis, a paresis of the left external rectus, a very slight

limitation in the movements of the right external rectus, but all other ocular movements were normal. The pupils reacted sluggishly to light, but well during accommodation. There was also intense photophobia, for which there was no apparent cause. The patient held his head in a peculiar position, different from that customary in patients having ocular palsies. There was such a disparity in the development of the symptoms that, on this account alone, a nuclear palsy of alcoholic or specific character could be excluded. However, he had no characteristic pupillary reaction, while he had a very marked photophobia. The unusual combination of symptoms led to a further examination, when it was discovered that the patient presented a very typical hemianalgesia. This symptom, in association with the photophobia and the apparent double ptosis, together with the variable character of the paralysis (varying within a period of ten minutes), led to the diagnosis of a functional or hysterical partial ophthalmoplegia. He had always been skeptical about these cases, and this was the first one he had ever seen.

The CHAIRMAN asked whether the presence of hemianalgesia determined the case to be functional, to which Dr. SACHS replied, "Not that alone." The fact that the symptoms vary from time to time was more important. The position of the head was unusual, and the photophobia was distinctly hysterical.

Dr. T. R. POOLEY asked whether there was any mydriasis, to which Dr. Sachs replied in the negative.

Dr. MARPLE said that at all examinations the patient showed homonymous diplopia (increasing towards the left side), and the head then was in the position usually assumed by patients with abducens paralysis.

Dr. SACHS said that the head now was not turned directly to one side, but to one side and inclined forwards in an oblique position.

Dr. H. KNAPP asked about the prognosis of hysterical ptosis, to which Dr. Sachs replied that it was good, and the patient's condition was already much improved.

Dr. J. O. TANSLEY said that he had seen two similar cases, both ending in recovery. In one case, seen with Dr. Seguin, metallo-therapy had been used. Analgesia was present. A couple of large gold pieces were laid on the patient's leg for a few moments, and afterwards pain was felt over the areas previously covered by the gold pieces.

Dr. SACHS said in conclusion that the disproportion between all the symptoms was a marked feature of the case. If so many ocular palsies were due to an organic lesion, it would have meant a very serious one. Moreover, such lesions are more often unilateral than bilateral, at least in the beginning.

Dr. J. H. CLAIBORNE presented two cases of plastic surgery: 1st. **Epithelioma of side of nose, inner canthus, and involving part of upper lid.** Hemorrhage very severe. Used sliding flaps. Had always thought that flap with hemorrhage under it would not adhere. But in this case he was sure that there must have been a large clot under the flap, but the latter healed perfectly. 2d case. **Epithelioma involving globe and orbital tissues.** Eye removed and operation much more extensive. Result excellent.

Dr. T. R. POOLEY said it had been his privilege to see Dr. Claiborne do both operations, and he could not but admire his dexterity. He never saw a case where so large a flap did so well. The resulting deformity was marvellously little. Referred to the severity of the hemorrhage.

Dr. WEBSTER asked if the angular artery could not have been tied. Dr. Claiborne said that the hemorrhage seemed to come from the bone.

Dr. J. O. TANSLEY presented: 1st, a case of **peculiar lenticular opacity,** being located in the middle of the lens a little to its temporal side, looking like a small piece of brown paper in the lens; 2d, a case of **exudative choroiditis,** in both eyes, so far uninfluenced by treatment; 3d, a case of **thrombosis of central retinal vein.**

Dr. W. H. BATES showed a specimen of **secondary cataract** from the rabbit nineteen days after extraction of the lens. According to Dr. Bates, the specimen showed that its structure was new connective tissue, *not* from the epithelium of the anterior capsule, but from cells which emigrated from the cornea (?)

Dr. ARNOLD H. KNAPP presented microscopic specimens of (1) a **myxoma of the cornea,** which had developed in a leucomatous eye, and (2) a **tumor of the orbit containing blood spaces and typical lymph follicles.**

REPORT OF THE TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY AT ITS MEETING AT NEW LONDON, CONN., JULY 20 AND 21, 1898.

By Herman Knapp, M.D.

The Society was called to order by the President, Dr. Harlan, of Philadelphia, at 9 A.M., July 20th.

I.—Dr. Lucien Howe, of Buffalo, N. Y., read a paper entitled, **Why the proportion of blind in cities is less than in the country,** of which the following is an abstract[1]:

"First. In the twenty-five largest cities of the United States the proportion of blind is, with two exceptions, smaller than in the States in which these cities are situated. Or, taking all the cities of over fifty thousand inhabitants together, we find in them about thirty-three per cent. less blind than the average for the entire country.

Second. When we examine the different factors in the production of blindness, whether congenital or acquired, or under the latter class whether due to traumatism, general disease, or to local diseases, we find these factors are all practically the same, or are made equal, in city and country, with one exception, namely, ophthalmia of infancy.

Third. A rather extended inquiry concerning the habitual practice of physicians in country, almshouses, hospitals, and elsewhere in the State of New York, indicates that more attention is given to guarding against ophthalmia of infancy in the cities than in the country.

Fourth. This tendency to the habitual neglect or habitual use of such prophylaxis tends to make a rapid difference in the dis-

[1] Quotation marks indicate that abstracts of the papers have been furnished by the speakers.

tribution of the blind, estimated at possibly 13 to 1. It is at least the most apparent cause of this difference and probably accounts for the greater part of it.

Fifth. It follows from this apparently warrantable conclusion, that if as great care were taken in general throughout the country as is given on the average in the cities to such prophylaxis, the number of blind in the United States would be decreased in a single generation by some few thousands.

While it is neither advisable nor possible to force by legislation any one method of preventive treatment upon physicians in private practice, on the other hand it is the right and duty of the State to provide, for children born in almshouses, the best treatment thus far known, and to require for them the use of the silver-nitrate solution or of any other prophylaxis which may, in the future, prove to be equally efficacious."

After the reading of his paper, Dr. Howe recommended the adoption of the majority report submitted to the Society at the meeting of 1897, which reads as follows[1]:

> We approve of the legislation which would result in the invariable use of this method [Credé's] or any other equally safe and efficient, in almshouses, whereby the loss of vision from this disease would be lessened.

The elaborate minority report (of Dr. Jackson) was read. It dwells particularly on the argument that a good many of the statistics given by Dr. Howe and taken from European authors, were not in harmony with those found in this country.

Discussion.—Dr. PROUT against, Dr. KIPP for, the majority report if it were made obligatory only to almshouses. With this restriction the majority report was adopted.

II.—CHARLES STEDMAN BULL, New York: **On shot-wounds of the eye and orbit.**

"The *first* case was a wound of the eyeball by No. 12 shot, one point of perforation being at the outer sclero-corneal margin, and a shot was subsequently removed from the bottom of the anterior chamber by a platinum scoop, with a restoration of vision of $\frac{20}{30}$.

The *second* case was also one of perforation of the eyeball by No. 12 shot, with total loss of vision, detachment of the retina, and subsequent cataract, but with no external evidence of disfigurement.

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[1] *Trans. Am. Ophth. Soc.*, vol. viii., pp. 1, 11.

The *third* case was a similar injury, with two perforations of the eyeball, with partial detachment of the retina, but with preservation of vision of $\frac{1}{18}$.

The *fourth* case was a pistol-shot wound of the eye, orbit, and nasal bones. The shot was a tangential wound, which destroyed the cornea and iris, and disorganized the tissues of the eyeball, with the exception of the lens, which was dislocated but uninjured. The injury necessitated enucleation and a plastic operation at the external canthus and another on the nose."

Discussed by Drs. GRUENING and BULL.

III.—CHARLES STEDMAN BULL, M.D., New York : **On some unusual tumors of the orbit and vicinity.**

"The *first* case was a **Cysticercus cyst of the lower lid,** occurring in an Italian boy of six years of age. It had existed for three months and resembled a fatty tumor, being situated in the subcutaneous cellular tissue. It was smooth, elastic, and painless, and the skin was freely movable over it. It was removed by a simple incision without the slightest difficulty, the cyst-wall being unbroken. A microscopical examination showed the scolex to be single with perfectly formed hooklets, and the suction disks were very prominent.

The *second* case was a **Fibro-lipoma of the accessory lachrymal gland,** occurring in a boy aged six years, of eighteen months' duration, and was accompanied by a small dermoid growth on the margin of the cornea. The tumor hugged the eyeball in the supero-temporal margin, and was removed through a conjunctival incision without difficulty. The microscopic examination proved it to be a fibro-lipoma of the accessory lachrymal gland.

The *third* case was a **Dermoid tumor of the sclera and cornea, complicated by an intraocular tumor apparently springing from the choroid.** The external tumor was congenital, the mother being a primipara. The child was first seen one month after birth. At that time there was no visible intraocular growth, and the lens was clear. Soon after the lower *cul-de-sac* and inner half of the lower lid became densely infiltrated, very pale, and resembled amyloid infiltration. Two months later a growth appeared within the eye and grew rapidly, extending towards the anterior in the temporal and inferior quadrants. This growth also caused rapid thinning of the sclera in the equatorial region, and in one month from its first recognition,

perforated the eyeball. The parents refused to allow enucleation of the globe. The growth extended into the anterior chamber and filled the pupil. The mass which protruded from the sclera was deeply pigmented and very soft. A piece was excised and examined. It consisted mainly of small round cells, with short fusiform cells and finely granular matter, with a few small blood-vessels. The child was seen in January, 1898, when he was a year old, at which time the extension of the intraocular growth was enormous in every direction. Since then the child has not been seen.

The *fourth* case was a **Tuberculous infiltration of the cornea, sclera, iris, ciliary body, choroid, retina, and vitreous,** occurring in a child aged three years, who had always been sickly, and had never walked. She lay in a semi-stupor most of the time. There was a yellow reflex from the fundus, resembling glioma, the eye was divergent and blind. The marasmic condition of the child, the fact that the father was sickly and had a chronic cough with expectoration, and the additional fact that two members of his family had died of tuberculosis, pointed to a diagnosis of tuberculosis, which was confirmed by the microscope. The child died five months later of abdominal tuberculosis.

The *fifth* case was a **Sarcoma of the eyelids, orbit, bones of the orbit and neighboring cavities, of traumatic origin,** occurring in a child aged three years. The traumatism was a blow at the outer angle of the left orbit, received by running against a post. The malignant disease of the bones and orbit began four months later. Three operations were done for the removal of the growth, but the child died ten months after the first operation. The microscope showed the growth to be sarcomatous."

Discussion.—Dr. H. KNAPP had seen two cases of traumatic sarcoma of the eyelids and orbit in children. They followed immediately after the hemorrhagic and serous swelling. The one, observed from the beginning, was operated on six weeks after the injury. The tumor was lardaceous, not capsulated, recurred in a short time, increased rapidly, and the child died about six months later.

The second was first seen about four months after the injury, when both lids were greatly swollen; the disease had extended into the orbit. No operation. Death four or five months later.

Dr. CARMALT says that traumatic sarcoma of other parts of the body is not rare.

Dr. W. B. JOHNSON had a parallel case to the traum. sarcoma of Dr. Bull.

Dr. POOLEY says that the evidences of tuberculosis of the eye are not always apparent.

IV.—Dr. EDWARD FRIDENBERG: **Exostosis of the frontal sinus with enophthalmos.**

"Dr. E. F. showed the tumor and photographs of the patient before and after the operation, which was performed in January, 1894. The tumor had been growing at least fourteen years, was situated at the centre of the left upper orbital margin, crowding the globe backwards, was about the size of a small walnut, tightly held by the anterior wall of the sinus, through which it had perforated, in a deep furrow nearly encircling the neoplasm, and dividing it into a larger anterior and a smaller posterior portion. It grew from the posterior wall of the sinus, to which it was attached by a rather broad pedicle of cancellous tissue. The tumor consisted of a shell of ivory-like bone, surrounding a cavity partly filled with cancellous tissue. Dr. F. commented on the better operative results in such cases at present than formerly, which he attributed to early interference, antiseptic precautions, and enlightened methods of operation."

V.—C. F. CLARK, Columbus, O.: **An abscess involving the frontal sinus, with destruction of the roof of the orbit and depression of the eyeball.** A woman of sixty years had a fall on her face, two years before she consulted the doctor. It was followed by ptosis, transient diplopia, and empyema of the frontal sinus. For some weeks there was a slight improvement. When she went to the doctor she had had a chill, and discharge from the nose. There was a soft swelling under the brow, which diminished by pressure. Incision liberated thick, inoffensive pus.

"The operation revealed absorption of the inner wall of the frontal sinus and roof of the left orbit and an abscess cavity extending 1¼ inches posteriorly in the horizontal plane, 2⅛ inches upward and backward at an angle of forty-five degrees with horizon, 2 inches upward along the frontal bone, and from the left temple to a point ½ inch above the right supra-orbital notch. One to two ounces of pus were evacuated.

At the end of two months with thorough irrigation daily the patient exhibited no unfavorable symptoms, the eye had returned

to its normal position, the cavity was diminished in size to a marked degree, and only a few drops of pus escaped through the drainage tube."

VI.—Dr. J. M. WILSON, Bridgeport, Conn.: **Case of fibro-sarcoma of orbit,** of twenty-three years' standing, in a woman, fifty-eight years old. "It was roughly spherical in shape, about 2⅝ inches in diameter; very slow growth, until within three years; front of eyeball 1¼ inches anterior to edge of orbit. Notwithstanding this great displacement forward, there was still perception of larger moving objects, slight reaction of iris to light, and some mobility of globe. Operation not as formidable as it looked, growth capsulated, not attached to bone of orbit at all. Periosteum smooth, front part hard, posterior soft and friable. Small portion left in apex of orbit.

Dr. WEEKS, pathologist, reports tumor to be a fibro-sarcoma, 136 grms. in weight, a portion having the structure of cylindroma."

Dr. Wilson showed photographs, before and after operation, and also the specimen.

Discussion.—Dr. POOLEY, who had seen the patient, said that the tumor was one of the largest he had come across.

VII.—Dr. E. GRÜNING, New York.: **Case of lipoma of orbit.** The speaker said that, as far as he had been able to look up literature, there was not a single case of pure lipoma of the orbit on record. His patient, a man of thirty-five, had a baggy, elastic, somewhat lobulated swelling in the lower lid. At the extirpation, it proved to be a capsulated oblong tumor, which the microscope revealed to be a pure lipoma. Dr. Grüning showed the hardened specimen.

Discussion.—Dr. HOLDEN said there was a great variety of tumors into which orbital fat entered as a conspicuous constituent. Of a very large one, removed by Dr. Born, he found two thirds to be a pure lipoma, one third an angioma.

Dr. DE SCHWEINITZ said that Dr. Bull had reported a well-marked case in an earlier article on tumors of the orbit.

Dr. KNAPP said he had at present under his care a case exactly like that of Dr. Grüning, only much larger. Patient, a woman of about forty-five, presented exophthalmus, restricted mobility of the eyeball, optic disk atrophic, vision gone. Both lids were pushed forward by soft, not circumscribed, swellings, the posterior limits of which, reaching behind the eyeball, could not be made out. The tumor in the upper part was divided into two large

lobes, of which he had removed one. The tumor in the lower part was the largest, occupying evenly the lower part of the orbit. It also was removed, and showed nothing but orbital fat, lined in front by a thin capsule. He intended to remove the last portion soon. The recovery, thus far, was satisfactory.

VIII.—Dr. S. THEOBALD, of Baltimore: **The treatment of entropion of the lower lid by caustic potash.** "The treatment advocated was especially applicable to senile entropion, but was useful also in entropion due to trachoma. Better results, it was thought, could be obtained by the use of the caustic than by the knife. Caustic potash was preferred to the actual cautery, because its employment did not necessitate general anæsthesia, cocaine being used instead. The requisite degree of sharpness of the caustic stick can be best obtained by rubbing it upon wet blotting-paper; to sharpen it with a knife is difficult. In applying it the aim should be to produce an eschar 3 to 4 *mm* wide, parallel with the lid margin, and extending the whole length of the tarsus. The action of the caustic should not be allowed to approach nearer the edge of the lid than 1½ to 2 *mm*.

When the requisite effect has been produced, the caustic action is checked by the application of vinegar diluted with an equal quantity of water, or a solution of acetic acid of about the same strength.

In a few minutes the eschar begins to contract, and the lid, which up to this time has been held in an everted position, no longer shows an inclination to turn in. It is seldom necessary to repeat the operation, but this can be done readily if the effect of the first application of the caustic has been insufficient. Within a few weeks all trace of the eschar has disappeared, and it is not possible to detect that an operation has been performed."

Discussion.—Dr. KNAPP thanks Dr. Theobald for this simple method to cure an apparently insignificant trouble, the operations for which made by him had not always given perfect relief.

Dr. GRÜNING says that he had always been successful in operating essentially according to Hotz.

Dr. NOYES operates practically in the same way.

Dr. JOHN GREEN operates with sacrificing almost no skin.

Dr. RISLEY removes a triangle of skin below the outer commissure.

IX.—Dr. MILES STANDISH, Boston: **Lymphoma of the lids** cured by the use of arsenic. This disease is no tumor proper.

One case was cured by extirpation. Another case was twice operated on; each time relapse followed. Then he used Fowler's solution, five drops three times daily. Recovery in some months.

Discussion.—Dr. DE SCHWEINITZ used liq. arsenii et hydrargyri iodidi in multiple lympho-sarcoma.

X.—Dr. S. B. ST. JOHN, Hartford, Conn.: **A case of spindle-celled sarcoma involving the conjunctiva and cornea; removal without impairment of sight** (with photograph and micro-photograph). "Man of seventy-two, seen May 7, 1898. About the end of March he noticed a lump on outer side of left cornea. No pain. Slight irritation. Vision, he says, is not affected by it. On testing: L = $\frac{10}{100}$, and with + 4 cyl. 180° = $\frac{20}{20}$. The lump is the size of a large pea, pale pink in color, a somewhat nodulated surface, does not bleed on touching, tolerably firm consistency. Evidently springs from conjunctiva, as the part overlapping the cornea is movable on the underlying tissue. I removed it by dissection from the cornea and by cutting out a piece of the conjunctiva, leaving a gap, which I closed by a sliding of the neighboring conjunctiva and securing with two sutures. The operation was on May 9th. I saw him July 8th, and there was no evidence of return and no irritation."

XI.—Drs. JOHN GREEN and A. E. EWING, St. Louis, Mo.: **Conjunctival melano-sarcoma involving the cornea.** Man, seventy years. The cells of the pseudoplasm, passing through Bowman's membrane, invaded the cornea.

XII.—Dr. H. F. HANSELL, Philadelphia: **A case of congenital interstitial keratitis.** "In a poorly nourished and feeble child both corneas at the time of birth were opaque. The lids were swollen and discolored, but not shiny or tense; the palpebral conjunctiva was partly concealed by a yellow, tough, and adherent membrane that could be removed only by force and in sections. Any manipulation of the lid was followed by bleeding. The ocular conjunctiva was nearly white, closely resembling at first sight the normal sclera, but careful inspection showed it to be infiltrated and elevated by serous exudation. A thin, yellow discharge, containing no mucus or pus, exuded from the palpebral fissure for ten days. The opacities in the corneas were densest in the centre, hiding the pupil from view. The periphery was clear. The opacity was gray in color, diffused, arranged in fine points very close to each other, and unaccompanied by iritis.

The epithelium remained intact. Toward the termination of the affection a few small blood-vessels formed in the tissue of the cornea, which doubtless hastened absorption of the opacity. In two months, under mild antisepsis and mydriatics, the corneas became almost entirely clear, and apparently preserved their normal curvature. The disease was attributed to the weakened condition of the mother during pregnancy. There was no family history of specific disease, and the child showed no sign of local or general infection."

XIII.—Drs. JOHN GREEN and A. E. EWING: **Hypopyon-keratitis; break in Descemet's membrane; preceding perforation fluorescin passed through the ulcer into the anterior chamber.** Two cases, the second traumatic, treated with nitrate of silver and peroxide of hydrogen applied with cotton on carrier. Tension increased during the formation of bubbles, but disappeared soon. Recovery in two months.

Discussed by Dr. HOLDEN.

XIV.—Dr. S. D. RISLEY, of Philadelphia: **On cassaripe,** the acrid expressed juice of the bitter cassava, as a useful remedy in the treatment of corneal ulcers and infectious diseases of the conjunctiva.

"His attention was called to the drug by Dr. H. B. Chandler, to whom its employment was suggested by its use in the tropics for the preservation of meats.

Two varieties are cultivated for the bulbous root, which contains farina in abundance. This is obtained by grating the root to a pulp, after which the poisonous juice is expelled by pressure and washing. The starch product forms the cassava bread of the tropics, while the juice is reduced by boiling to a syrupy liquid, which forms the basis of the West Indian pepper pot, used extensively as a condiment by the natives. When poured over meats it preserves them almost indefinitely from putrefaction. This prepared juice is known as cassaripe or cassareep. The varieties of the cassava usually cultivated are the bitter cassava, Manihot utilissima, and the sweet cassava or Manihot Aipi. The latter is innocuous and used extensively as a vegetable, while the former is poisonous and the source from which the cassaripe is obtained. They both belong to the *Euphorbiaceæ* or Spurge family. There seems, however, to be no sufficiently specific botanical characteristics to differentiate the two forms, even the natives often mistaking the poisonous for the innocuous variety

in preparing their food, from which deaths are known to have occurred.

The method adopted for the use of the cassaripe as a therapeutic agent was in the form of a ten per cent. ointment, vaseline being used as the excipient. It caused no irritation, but had proved a valuable means of treating ulcers of the cornea and infectious diseases of the conjunctiva."

The ointment is to be had at Metcalfe's pharmacy in Philadelphia. The remedy was introduced by Dr. Chandler, of Boston.

Discussion.—Dr. M. STANDISH used cassaripe ointment put in the conjunctival sac in the evening. It is a good antiseptic, but not always reliable.

Dr. EDWIN JACK, of Boston, says the ointment is quite irritating in many cases.

XV.—Dr. G. HAY, Boston : **On the position of the eyeball during the Listing rotation, as compared on the one hand with the successive positions of a vertical plane passing through the respective line of sight, and on the other with the successive positions of the plane of sight; these two planes changing their positions in the eyeball as the particular Listing rotation proceeds, and this change explaining the apparent inconsistency between the Donders inclination and the Helmholtz rotation.**

Some of the principal features of Dr. Hay's paper are indicated by the following :

"As the Listing rotation proceeds, carrying the line of sight from the primary position to a secondary one, there are, or may be conceived, two great circles, which are determined by definitions, and which, in order to conform to their definitions, must each change its place in the globe ; the plane of one of them always cutting a certain plane outside the globe, and which for brevity may be called plane of projection, in a vertical line, and that of the other always cutting it in a horizontal line.

Now if we consider the position of the globe as indicated by that of a fixed plane in the globe, and if we take for our fixed plane that of the prime vertical meridian and compare its position with the position of one of the moving great circles, that whose plane always cuts the plane of projection in a vertical line, we find that we come to the conclusion of Donders as regards the inclination of the vertical meridian. If, however, we consider the position of the globe as indicated by another fixed great circle,

the retinal horizon, and compare the position of this with the position of the other moving great circle, which is in the plane of sight, we come to Helmholtz's result as to his "Raddrehung" (wheel-rotation, torsion). That is, the two results represent different aspects from, as it were, different points of view of one and the same process, the particular Listing rotation.

If we extend our view from the great circles in the globe to the intersections of their planes with the plane of projection, it may be said that the globe, rotating according to Listing's law, has two relations to the plane of projection ; one by means of the moving vertical plane, the other by means of the other moving plane, the plane of sight. The Donders inclination and the Helmholtz wheel-rotation may both be regarded as *relative* rotations of the globe about the line of sight ; but by *relative* is meant that it is not the globe which rotates, but one of the moving great circles rotates about the line of sight and away from one of the fixed great circles. It may be noted that the four great circles referred to, the two fixed and the two moving, all pass through the line of sight.

As for the inclination of the vertical meridian for a secondary position of the line of sight, it is held that it does not signify a rotation of the globe around the line of sight ; for two reasons : first, because, from considerations given elsewhere, such rotation does not occur during the Listing rotation proper ; second, because the inclination is explained by the relative situations of the prime vertical meridian and the vertical-moving great circle as they are situated in the eyeball in consequence of the Listing rotation, and by the fact that the plane of the latter great circle cuts the plane of projection in a vertical line."

XVI.—Dr. J. B. WORRELL, Terre Haute, Ind. : **Spontaneous extrusion of foreign body from anterior chamber.** "Two weeks after receiving an injury of the eye while exploding a gun-cap, a lad fifteen years of age appeared for treatment. There was present great engorgement of the eyeball, sclera being livid in color, cornea opaque and somewhat bulging in the inner-lower quadrant. Under atrop. and compress bandage in a few days the eye was much better, the condition of the cornea permitting a fair view of the upper part of iris and pupil. In the bottom of the anterior chamber lay a yellowish ovoid mass with well-defined outlines. The pupil presented a notch on its lower edge from laceration of the sphincter. Corresponding with the position of this notch was seen a small rupture of the anterior capsule.

The progress of the case continued favorable. Six weeks after coming under treatment the foreign body was discovered situated in the inner layers of the cornea. From this position it gradually worked its way out unattended by any irritation, and was found a few days after in the secretions of the conjunctival sac.

The final examination showed a clear cornea with the exception of a crescentic nebula near the lower limbus. From the anterior capsule a white band, to which the torn edges of the iris had become adherent, runs forward and downward and becomes adherent to cornea in neighborhood of the crescentic nebula. Eye entirely quiet. V = $\frac{15}{XL}$."

Discussion.—Dr. HANSELL had a case where a foreign body, after having lain quiet in the anterior chamber, half perforated the cornea and was drawn out.

XVII.—Dr. W. F. MITTENDORF: **Some of the earlier symptoms of senile cataract.** Dr. Mittendorf has notes of 608 cases of incipient cataract. The earliest symptoms were a central haze in 206, and peripheric opacities in 402; the opacities were most pronounced in the lower-inner quadrant of the lens.

Discussion.—Dr. CLARK found among 250 cases 46 with good vision and good accommodation. Dr. RISLEY said that the opacities of the inner-lower quadrant commonly were connected with choroidal changes.

XVIII.—Dr. H. KNAPP: **On the operations for secondary cataract.** "Dr. Knapp begged to speak on this much-discussed subject, because he had to report a recent disastrous case of discission, the first among many hundreds of successful cases. It occurred in a sixty-year-old, delicate lady, who had made in March of this year a good recovery from a simple extraction. Discission six weeks later, followed in the third night by a violent attack of glaucoma. Morphine and myotics gave little relief. Attempt at an iridectomy failed, the iris drawn out slipped back at the moment of cutting. Some vitreous escaping, and the iris being crowded to the periphery, no further attempt was made. Relief for six days, then diffuse opacity of the vitreous and increased tension being present, another iridectomy succeeded at the first attempt. The patient was relieved, but her vision is at best $\frac{1}{200}$, and the tension of the eyeball diminished.

From October, 1897, till July, 1898, Dr. Knapp has made 70 operations for secondary cataract. There were 2 more cases of glaucoma following discission; the one, violent, was promptly cured

by an iridectomy; the other, mild, was cured by myotics. Of the 70 operations, 64 were discissions, 6 operations with forceps-scissors, *i. e.*, 1 capsulotomy, 5 iridectomies. Besides the above two cases of acute glaucoma, there was no serious reaction in any one.

The visual results were: Loss of sight in 1 eye; vision the same as before in 5; improvement, mostly considerable, in 64. Dr. Knapp speaks of the danger of tearing, in the attempt of cutting tough capsules, at the ciliary body, in particular at that part which adjoins the scar of the extraction wound. He described Bowman's method of discission, a comminution of the capsule, which is still largely practised, and differs essentially from the method he has practised and advocated so long. Where the capsule is tough, discission should be substituted by extraction, or capsulotomy (cystotomy), iridotomy, or cyst-iridectomy."

Discussion.—Dr. ROOSA would not operate when V is $\frac{20}{200}$; advocates Panas's method—extraction.

Dr. NOYES has had good results with the two-needle operation; extracts tough capsule; eyes with narrow pupils are likely to give trouble.

Dr. KIPP never has had suppuration, but bad results from extraction.

Dr. CALLAN lost an eye by suppuration.

Dr. CLARK, in closure of the pupil, makes a peripheral incision through cornea and iris, and excises a piece of iris with three cuts, two lateral and one central.

POOLEY and WADSWORTH have made many operations for secondary cataract.

HOWE has designed a double-bladed instrument, acting like a punch, to exsect a piece of iris in pupillary closure after extraction. He asks how far infection and how far traumatism are to blame for unfortunate results.

KNAPP believes that introduction of germs during discission can easily be avoided and must be rare, but germs introduced during the extraction, and having lain dormant, may be waked to life again by traumatism.

XIX.—Dr. B. E. FRYER: **Protargol in the antiseptic preparation of the conjunctiva prior to cutting operations on the eyeball.** "After Neisser had found that protargol solutions used clinically possess an antiseptic power greater than corresponding solutions of nitrate of silver, argentamin,

argonin, etc., Fryer has used it in sterilizing the conjunctiva. After washing lids, brow, and cheek with soap, and then with a 2½ % solution of carbolic acid, he flushes the conjunctival sac with a 2 % solution of protargol, and covers the lids with sublimate gauze held by strips of isinglass plaster. These flushings are repeated twice daily until the conjunctiva is surgically clean. The sterilization may require a week. A microscopic examination is made every day or two, which alone can give positive evidence, absence of secretion not being sufficient. . . . Dr. Fryer believes that with protargol properly applied we have one of the safest and quickest means of rendering an eye surgically clean."

XX.—Walter B. Johnson, M.D., Paterson, N. J.: **Buphthalmia, an interesting series of three cases occurring in the same family.** "Of the three cases reported, two were operated by Professor De Vincentiis in Naples, and one in this country by Dr. Johnson. Photographs of the two older children taken recently, and of the baby before and after operation, accompany the report of the cases.

There was no family history of specific disease or any of eye trouble. The first three children, two boys and a girl, had no physical defect; the next three children, all girls, suffered from buphthalmia, which appeared in the second or third month.

Case 1.—At two months parents first noticed eye trouble, which was neglected, and increased until patient was two years of age, the eye growing constantly larger with accompanying distressing symptoms. The child was then operated, probably sclerotomy; progression was checked, the symptoms abated, but the vision, which was then lost, never returned. Vision at present is R E, V = no perception of light; L E, V = fingers at two feet. The eyeballs are enormously enlarged. The diameter of the cornea is ½ inch in the horizontal and ⅝ inch in the vertical meridian. The right iris is adherent to the lens capsule; the lens is cataractous. The left eye pupil is moderately dilated and sluggishly reacts to light. The vesicles are decreased in size, the disk behind white and considerably cupped.

Case 2.—Similar to the first. Disease first noticed when one month old. Operated when two months old—the right eye iridectomy, the left eye sclerotomy. She appears to have useful vision, and has no cupping of Od. in the left eye.

Case 3.—First examined child when six weeks old. Slight enlargement of eyeballs, which gradually increased. Eserine sul-

phate, gr. ¼ to ℥i of water, was used without appreciable effect. When four months old ocular tension was + 2. Operation was advised, and performed—double iridectomy. Child was restless and removed bandages. The right eye healed, leaving a satisfactory coloboma. In the left eye the cut edges of the iris prolapsed, became incarcerated, leaving a leucoma and distorted pupil.

On July 12th the child was examined. Has some intolerance of light in bright sunshine. Eyeballs do not grow disproportionately to the growth of the body. She appears to see well, ocular tension is normal, other symptoms are entirely abated.

In the right eye the coloboma is satisfactory. In the left eye the iris is incarcerated and the pupil distended. The ophthalmoscopic examination discloses the view of the fundus unsatisfactorily, but apparently a normal eye-ground. The indications point to future useful vision."

Discussion.—Dr. PROUT: In restless children a stitch through the lids keeps the eyes closed.

XXI.—Dr. G. E. DE SCHWEINITZ, Philadelphia: **A contribution to the pathological anatomy of the eye and its appendages.** "Under this title Dr. De Schweinitz reported:

(1) *Two cases of metastatic carcinoma of the choroid, one of which was examined clinically and microscopically, and the other clinically only.* In the first case the patient was a woman aged forty, and the choroidal growth was a metastasis to the choroid of the right eye from a carcinoma of the left breast. It presented the microscopical appearances of alveolar carcinoma with emboli of cancer cells in the vessels of the choroid and in the ciliary vessels. In the second case the patient was a woman aged forty-three, and the growth was a metastasis to the left choroid from carcinoma of the left breast. There was no microscopical examination, the diagnosis being an ophthalmoscopic one. There are now on record twenty-five cases of this affection, the original site of the tumor being the breast in nineteen, the stomach in two, the lung in two, and the thyroid in one. In one case (Holden's) the carcinoma was found in an eye of which there was no clinical history.

(2) *Leuco-sarcoma of the choroid enucleated in the stage of glaucoma*, which presented the usual appearance of small-celled sarcoma, but which was interesting because its earlier history was exactly that of ordinary detachment of the retina, the first failure of vision having appeared suddenly during a violent paroxysm of

coughing, the eye being myopic. Even when examined before the stage of glaucoma, the ordinary diagnostic symptoms of retinal detachment by tumor were wanting. The tumor sprang from a flattened base, from which it was separated by a marked constriction, indicating where the tumor had ruptured the layers of the choroidal capsule; above the neck it was pear-shaped.

(3) *An angioma of the lachrymal gland and orbital tissue, extending to the apex of the orbit; removal with preservation of the globe, the functions and the external muscles of the eye.*—This growth occurred in a boy aged eighteen, and was first noted in early childhood, appearing in the upper and outer portion of the orbit and the upper and outer part of the eyelid as a purplish mass. It was removed by a dissection carried to the apex of the orbit. On microscopic examination it proved to be a typical cavernous angioma, which had invaded the lachrymal gland. Incidentally Dr. De Schweinitz discussed the development of angiomas in glandular tissues, the paper being illustrated with microscopic slides and drawings.

(4) *A primary carcinoma of the caruncle,* which occurred in a man aged fifty-two, and appeared as a small tumor at the inner canthus growing from the caruncle. It was composed of large tubules or plugs of epithelial cells, separated by a faint stroma of spindle and round cells. In the centre of the tubular prolongations were many spots presenting the appearances of the so-called 'concentric globules.' There had been no recurrence at the time of the report, about three months after the operation.

(5) *A growth situated in the region of the lachrymal sac presenting the histological characters of tubercle.* This growth, about a centimetre in length and 5 millimetres in width, was found imbedded in the fibres of the orbicularis muscle, of grayish-white color, situated just in front of the lachrymal sac, and attached to its wall by a pedicle, but had not penetrated it. In structure it exactly resembled miliary tubercle, being composed of lymphoid cells, epithelioid cells, and giant cells. Tubercle bacilli, however, were not found. The patient from whom the growth was removed was a healthy man aged twenty-nine. The neoplasm was accidentally discovered while passing a probe through the lachrymo-nasal duct."

Discussion.—Dr. BULL had seen a similar growth in the region of the lachrymal sac, which was a cyst; no bacilli or other symptoms of tuberculosis. No recurrence these eight years.

XXII.—Dr. R. SATTLER, Cincinnati, O.: **The surgical treatment of keratoconus and high degrees of myopia.** Dr. Sattler relates a case of a high degree of congenital myopia in a girl of sixteen years, whom he had successfully treated with discission. Two brothers were afflicted with the same disease.

The surgical treatment of keratoconus is dangerous and always tedious. He related a successful case and advises to operate on one eye only.

Discussion.—On inquiry by Dr. KIPP, Dr. Sattler said one other case had been unsatisfactory, and in three others the results had been negative.

Dr. NOYES had a case in which he excised a piece and stitched the wound up; the affection remained stationary.

Dr. SUTPHEN said in a case of superficial cauterization the disease had remained stationary.

Dr. KNAPP said, in former times when, afraid of the danger, he had cauterized superficially, the treatment had been negative, *i. e.*, followed by no marked improvement. During the last six or eight years he had used galvano-cautery, with a disciform electrode. Without perforation of the cornea the effect was slight, and the operation had to be repeated. Of late he therefore had perforated the cornea; the results had been good, no eye lost; in one eye the heat had produced a cataract; the eye after extraction obtained very good sight. He had usually applied the electrode a little below the centre of the cornea, had made iridectomy in two cases, in one for optical purposes, in the other for glaucoma which had set in when the corneal fistula had closed.

Dr. KIPP said in one of his cases the eye was well six weeks, then the cornea sloughed.

Regarding the surgical treatment of keratoconus and excessive myopia, Dr. GRÜNING wants clearer statistics as to vision improved, eyes injured in structure or appearance, etc.

Dr. BULL has records of 270 cases of M. of 12 D. or more. In only three of them he could conscientiously advise operation, but the patients declined. In one case he had operated on, the result was no improvement of vision, but thickening of the capsule, which he does not venture to touch.

Dr. ROOSA agrees with Dr. Bull, and his opinion is strengthened by what he has seen in Paris.

Dr. RISLEY concurs with Bull and Roosa.—In keratoconus the protrusion frequently is cylindrical to such a degree as to afford considerable increase of vision by cylindrical glasses.

Dr. JOHNSON gave comfort with high cylinders, and raised vision up to $\frac{20}{30}$ or $\frac{20}{40}$. Never operates.

RISLEY prescribed cylinders of 20°. Mydriatics give comfort; produce no aggravation.

Dr. WILMER prescribed cylinders, and the keratoconus progressed.

Dr. DE SCHWEINITZ, the same in children; in older persons his experience with strong cylinders has been most happy.

Dr. NOYES has used hyperbolic glasses, but has abandoned them.

Dr. RISLEY, the same.

Dr. STANDISH, in contrast with others, has used parabolic lenses extensively and with good effect. Dr. Sattler has used parabolic lenses with good effect. He resorts to operation only in high degrees of keratoconus, with vision $\frac{5}{200}$ or less.

XXIII.—Dr. H. D. NOYES: **Remarks on myopia; report of a case of removal of both crystallines for high myopia.**

"Reviewing over seventeen hundred cases of myopia recorded in private practice, it was found that 7.6% exceeded 10 D. Among these it was rare to find vision above 0.4. In many instances it was much less, while in four cases it reached $\frac{20}{30}$, and so continued during years. Circum-optical atrophy was of course common, and lesions at the macula presented themselves in varying degrees. Scrutinizing the cases with a view of operating by Fukala's plan, two serious considerations arise: one, intraocular hemorrhage; the other, detachment of the retina. A third possibility cannot be entirely ignored, viz.: a low grade of irido-cyclitis produced by traumatism, causing turbidity of the vitreous and defeating the purpose of the operation. While hemorrhage may be spontaneous, it is not induced so readily by needle operations as by sections for extraction, and published reports do not specify this accident. On the other hand, detachment of the retina is the misfortune chiefly dreaded. It has been reported after Fukala's proceeding—yet it is not clear that the interference with the crystalline has been the real cause of it.

With a view of learning something, if possible, on this point, seventy-four cases of detached retina were studied. Of these about one half were in myopic eyes, and only a very small proportion occurred in those whose myopia was high. While the books say that detachment of the retina is especially prone to ac-

company high myopia, we are justified *a priori* in believing that the choroido-retinal changes which usually belong to these cases, tend by adhesive inflammation of the membranes to counteract this occurrence. Experience shows that the very large proportion of retinal detachments are found among the grades of myopia below 10 D.

The case of myopia operated on by removal of the lenses was as follows: Miss D., Brooklyn, N. Y., seen at two years of age, in 1888. She had converging strabismus and myopia whose degree was not measured. The father was decidedly myopic. When five years old she was wearing − 3 D. In 1896 M. was found to be 13 D. O.D.V = 0.2−; O.S.V = 0.2 +; converging strabismus. Each eye operated on by discission, and in one the lens removed by linear extraction, in the other it was allowed to absorb. In both eyes an operation was done on the capsule. In one eye this was done with a very narrow Graefe's knife which unintentionally cut the cornea too freely and incised the pupillary margin. Prolapse of iris took place which was reduced by a probe, but coloboma and astigmatism remained. In one eye treatment extended over six months, in the other eye it was completed in three months. The ultimate result was that the refractive conditions were altered to the amount of eighteen dioptries. Patient wore convex glasses O.D. + 5. V = 0.3 +; O.S. + 5. ⊃ + 2.^{c} 90°. V = 0.4 +. For reading, an additional + 3. was ordered. In the fundus there were slight changes about the macula in the right. In both eyes the vitreous was clear, and the pupil clean.

The patient never had diplopia, she did not have binocular vision, the strabismus remained, although in less degree. During the period of several months, when one eye was myopic and the other hyperopic, she preferred the hyperopic eye even when uncorrected. While now obliged to wear glasses, she is much gratified at the change in visual ability compared to former myopia."

Discussion.—Dr. WILMER has operated on three cases for excessive M. One is published in the *Arch. of Otology* of 1898. In the second case, five days after operation + T_1. Extraction. Some vitreous escaped. Healing smooth. V = $\frac{20}{200}$. Capsulotomy. V = $\frac{20}{60}$. M. decreased 23 D by operation. With cyl.-spher. V = $\frac{20}{30}$. M. about 24 D, the best condition for operating.

Dr. Noyes does not want to limit the operation to the highest degrees; 14 D and more seems best. The choroidal condition should be carefully considered. Dr. CLARK asks why Dr. Wil-

mer does not make it a point to remove the cataract cleanly. Dr. Wilmer thinks a subsequent capsulotomy involves less danger than much manipulation and gives better results.

XXIV.—Dr. T. Y. Sutphen: **Case of sympathetic ophthalmia from adhesion of lid to stump—enucleation—recovery.** After an enucleation an adhesion of the lid to the stump and the optic nerve had occurred, followed by sympathetic ophthalmia, which was cured by the removal of the stump.

XXV.—Dr. Geo. C. Harlan, of Philadelphia: **On delayed union after cataract extraction.** "Two cases are reported in which the wound remained open in one for more than ten days and in the other for three weeks, with nothing in the local conditions to account for the delay in either. In the former the wound closed under continued use of atropia and bandage and attention to the general health, and in the latter the anterior chamber was re-formed a few days after the mitigated nitrate stick was applied to the wound. There was a good final result in both.

Several cases are cited from the literature of the subject, which is meagre, in which union was delayed for from two to four weeks without preventing a favorable termination.

It was found that of 500 consecutive extractions performed at the Wills Ophthalmic Hospital the wound had closed in less than five days in 474, in nearly all of them within forty-eight hours. In 26 cases the union was delayed longer than this time. In 9 of these the wound remained open for five days, in 2 for six days, in 2 for seven days, in 2 for ten, in 3 for eleven, in 2 for twelve, in 1 for thirteen, in 1 for fifteen, in 1 for sixteen, in 1 for seventeen, in 1 for nineteen, and in 1 for twenty days. Fifteen were simple operations and 11 combined. Prolapse of iris occurred in only 2 cases. In 2 cases the delayed union occurred in both eyes, and in a third the wound of a preliminary iridectomy, performed a month before the extraction, remained open for five days. The patients all did well, and the V attained varied from $\frac{1}{2}$ to 1, a case in which the wound did not close for fifteen days being included in the latter.

The various causes for delayed union that have been suggested are: an irregular or ragged incision; the presence of bits of capsule, lens debris, or vitreous shreds in the wound; hernia of the iris; adhesion of the iris to the posterior lips of the wound; pinching of the conjunctiva or iris in the angles of the wound; entropion occasioned or increased by the dressings; dis-

turbance of the wound by too frequent examinations and dressings; excessive secretion of aqueous humor; and failure of reparative power due to something in the general condition of the patient. The author, while not questioning the effect of some or all of these local causes, is inclined to think that in the cases that have come under his observation the chief factor has been simple failure of reparative power.

In the treatment of this condition it is recommended to pursue a conservative course with compress and atropia for at least a month if the wound is clean and in good apposition. If there is capsule or lens debris in the wound it should be removed. Prolapse of the iris requires iridectomy; and iridectomy has been reported successful in a number of cases where there has been no prolapse. Stimulation of the wound by nitrate of silver, solution of iodine, and galvano-cautery has been followed by speedy cicatrization in three reported cases. If there is entropion it should be relieved by operation, or if it is caused by the compress this should be removed."

Discussion.—Dr. NOYES said in one case the wound united in two weeks.

Dr. GRÜNING says sections with a conjunctival flap close more readily than sections in the clear cornea.

Dr. STANDISH said in Boston they found no difficulty in the closure of the wound when they made the button-hole extraction. They now made a very small round opening into the iris near the corneal section. Prolapse of iris was very rare.

Dr. KNAPP said in one of his cases of slow closure of the wound glaucoma occurred four or five months later. He thought that a small shred of conjunctiva might have been between the lips of the wound, kept the wound open long, and produced glaucoma as corneal fistulas do. The glaucoma was cured by iridectomy. He is in the habit of passing a grooved probe through the wound at the end of each extraction, to stroke particles out.

XXVI.—Dr. A. E. ADAMS, Newburgh, N. Y.: **Two cases of premature delivery to preserve sight.**

"Case 1.—A primipara, pregnant seven months. Urine had been examined, but no albumen found. There was a marked optic-neuritis and some retinitis; later a few fan-shaped hemorrhages appeared. Vision was reduced to perception of light before labor was induced.

A living child was delivered.

Three years later vision was $\frac{20}{30}$ in each eye, and there was albumen in the urine.

Case 2.—A primipara, pregnant six and a half months. The urine was loaded with albumen. Numerous retinal hemorrhages, of dark color and irregular shape, and large plaques of exudation.

Vision failed rapidly and was reduced to perception of large objects. Recovery was slow. One year after delivery the R V was $\frac{20}{30}$ —; L V $\frac{15}{200}$. The urine contained albumen.

Two-thirds of these cases of albuminuric neuro-retinitis complain of some disturbance of vision, and eye complications occasionally exist when no albumen can be found in the urine.

It appears desirable that this condition should receive more attention, especially in public institutions."

XXVII.—Dr. WARD A. HOLDEN, New York: **The pathology of experimental quinine amblyopia.**

"Half an hour after a toxic dose of quinine is given to a dog, the retinal vessels become greatly constricted and vision is completely lost. After two or three days, a fair degree of vision returns, as a rule, and remains unless another dose is given.

In this investigation a number of dogs were killed at periods ranging from two hours to seven weeks after the first injection of quinine, and the eyes, optic nerves, brains, and cords were examined by the Nissl methylen-blue method for cell changes and the Marchi osmic-acid method for nerve-fibre changes. Two hours after injection no changes were found. Retinas examined on the third day after several toxic doses had been given, revealed degenerative changes in a few ganglion cells (vacuolation, paleness and absence of chromophilic granules, breaking down of the cell body), and changes in the nerve fibres (a deposition in the nerve-fibre layer of large globules of a myelin-like character). On the 9th and 17th days more ganglion cells were found affected and more myelin globules were present. On the 17th day the first changes in the optic nerve were noticed, consisting in a breaking down of the medullary sheaths of a number of fibres. On the 42d and 47th days the ganglion-cell layer and the nerve-fibre layer had almost entirely disappeared, leaving large cavities, and the myelin globules were no longer present. Many of the fibres of the optic nerve were broken down, and the degeneration of the nerve could be traced up to the termination of its fibres in the external geniculate body and pulvinar. The ganglion cells of the external geniculate body were still normal, however, and

no signs of degeneration were found elsewhere in the brain or in the cord.

So-called retinitis of the inner layers of the retina follows disturbances in the retinal vessels which supply the six inner layers. After embolism and in chronic glaucoma these layers degenerate and disappear entirely, and an ascending atrophy of the optic nerve ensues. With the lessened but not abolished blood-supply due to spasm of the vessels in quinine poisoning, the less resistant elements of the inner layers—the ganglion cells and nerve fibres—break down, while the cells of the inner nuclear layer are not visibly affected. An ascending degeneration of the optic nerve follows the retinal changes. Although greatly constricted, no histological changes were found in the retinal vessels."

Discussion.—" Dr. DE SCHWEINITZ referred to the researches of Brunner, Barabaschew, and himself, made nine years ago, when the newer histological methods used by Dr. Holden had been unknown. What these experimenters had observed might be called *secondary* effects of the toxic action of quinine which *primarily* attacked the ganglion cells and inner layers of the retina, causing an ascending atrophy of the optic nerves and tracts.

The gaps in our knowledge of the pathogenesis of experimental quinine amblyopia had now been filled with one exception, the primary contraction of the retinal vessels which caused the ischæmia."

XXVIII.—Dr. J. P. MORREL related a case of **Sympathetic irido-choroiditis.**

XXIX.—Dr. RISLEY spoke of a case of enucleation in which he, for obtaining a better stump, had **inserted a piece of sterilized sponge** into Tenon's capsule. In a few days a part of the sponge protruded and was cut off. Three weeks later granulations pervaded the sponge. They subsequently contracted. The patient was discharged in six weeks. Further result to be reported at next meeting. In France several cases had been published. In one the experiment had resulted in a good stump three months later.

XXX.—Dr. KIPP presented a **chalazion-forceps** having a solid plate at the end of one branch, an elongated fenestrated plate at the end of the other. The forceps was so applied that the swelling of the Meibomian gland protruded through the elongated gap and had only to be incised, after which the con-

tents were pressed out by the closure of the forceps without any further cutting or curetting.

At 1 o'clock, July 21st, the meeting was closed.

The following officers had been elected at an executive session held the previous evening: Pres., Dr. O. F. WADSWORTH, Boston; Vice-Pres., Dr. C. S. BULL, New York; the other officers were re-elected. Many new members were admitted.

BOOK NOTICES AND REVIEWS.

System of Diseases of the Eye. By American, British, Dutch, French, German, and Spanish Authors. Edited by WILLIAM F. NORRIS, A.M., M.D., and CHARLES A. OLIVER, A.M., M.D., of Philadelphia, Pa., U. S. A. Vol. iii., 1898, pp. 962. With fifty full-page plates and one hundred and eighty-six text illustrations.

In this volume we have the clinical side of ophthalmology, presenting with fulness every important subject except diseases of the cornea and of the crystalline lens—of the fourteen papers (for there are no divisions with chapters), eight are by American, three by British, and three by German authors. It is impossible to touch upon all the topics presented—and selection is determined to a considerable degree by chance. Addressed to readers already familiar with ophthalmology, the points which naturally suggest remark, are those about which there has been obscurity or controversy, or which may be put in a forcible or novel way. Each subject is handled by writers who are recognized as qualified to speak with authority.

Regarding tumors of the orbit, with which the book opens, Dr. Bull remarks that, "except in the case of encapsulated tumors of the orbit, surgical interference is almost invariably followed by a return of the tumor, and the growth of the secondary tumor is more rapid than that of the primary lesion." "Repeated operations in these cases undoubtedly shorten the life of the patient," etc. Empyema of the frontal sinuses has within a few years been emphasized by several writers, and Dr. Bull considers it at some length—and the suggestions about operating accord with those which have lately been put forth by Kuhnt.

Diseases of the eyelids and operations upon them are considered with so much regard to detail that one hesitates to suggest anything in addition—yet for congenital ptosis the method of Van Vliet is in some respects an improvement upon what has hitherto been done, and for blepharoplasty a flap from the middle of the forehead with its pedicle downwards has served the writer admirably in a number of cases. Dr. Harlan has arranged and selected his material, taken from his own large experience and from literature, with much discrimination.

The paper by Dr. Burnett on diseases of the conjunctiva and sclera will meet with the concurrence of ophthalmic surgeons generally. He brings down to date our knowledge of the influence of micro-organisms in etiology, and in treatment contributes his experience with formalin (a 40% solution of formaldehyde), which "may not supplant nitrate of silver in the acute stages, but in the later stages of purulent conjunctivitis can be used in the strength of 1 to 1000 or 2000 as a cleanser. In the strength of 1 to 500 its effect is about that of silver of two per cent." He especially commends its use 1 to 500 at the late period when corneal ulceration is only beginning, and when the suppuration has become much ameliorated, p. 193. He agrees with the proposal of Dr. Laertus Connor to combat commencing involvement of the cornea when this membrane has a steamy look or shows points of ulceration, by immersing the eye in a cup filled to the brim with water as hot as can be borne: to do this for some minutes every one, two, three, or four hours, pp. 187, 188. The same proceeding, but with greater persistence, is advised in treating diphtheritic conjunctivitis when the stage of infiltration is thoroughly established. A wide experience has established the value of solutions of corrosive sublimate 1 to 500 or 1000 as a local application with or without expression, friction, grattage, or brossage in treating granular conjunctivitis. In the New York Eye and Ear Infirmary it is greatly relied on and also in many European clinics. The remedy is not included among those on which Dr. Burnett relies. He calls attention to many of the rarer affections, viz.: pemphigus, lymphoma, amyloid, tuberculous tumors, etc. A large amount of labor has been expended on these brief descriptions, and it is to be hoped that our clinical material may in future be considerably enriched in reports of such cases. The writer ventures to call attention to the production of astigmatism by pterygium which will disappear on the removal of the growth, and says that this furnishes a reason for operating at an earlier period than would usually be deemed advisable.

In the article on diseases of the iris and ciliary body, attention may be called to the remarks on tubercle, p. 296, and to "general remarks upon the pathogenesis of primary iritis," pp. 300 to 303, which contain much interesting matter, and the quotation of references is especially acceptable. We must hasten on and call attention to one of the most interesting features of the book, viz.: pages 366 to 378, devoted to diagnosis of choroidal tumors. Dr.

Griffith presents with great completeness the complications which may co-exist with and the conditions which simulate tumor. In presence of retinal detachment every one knows what embarrassment arises, and while reduced or increased ocular tension may furnish a most valuable hint, cases occur in which the state of tension may furnish no information or may even be misleading. For example, the writer has seen a sharply defined globular mass in an eye having normal tension pronounced choroidal tumor by more than one experienced observer, and which proved to be detachment of the retina with greatly thickened walls. Again, Dr. Griffith cites a case of chronic localized choroiditis with deposit of bone and retinal detachment on which were splashes of blood, and the expectation was that a tumor would be found—but no tumor existed. It is impossible to do more than direct attention to the extremely suggestive remarks on this matter. As to prognosis, he found that among twenty-three cases of sarcoma, 60% were alive and well from three to ten years after operation. He confirms Fuchs's observation that the stage at which the eye is enucleated has little, if anything, to do with the occurrence of metastasis. Text-books, he says, are, with the exception of Berry's, barren in discussion of this topic: in *Diseases of the Eye*, by H. D. Noyes, 1894, he will find on page 592 a summary of the essential facts known at that period.

The relationship of staphyloma posticum to myopia, pp. 395–411, by Prof. Schnabel, of Vienna, presents a view of the anatomy of this condition considerably at variance with prevalent opinions. The following statements are quoted, p. 399: "When in the anatomical examination of a myopic eye a staphyloma is found, one may almost certainly expect to find a conus (the choroidal crescent); when, however, the presence of a conus has been recognized by the ophthalmoscope in the examination of a myopic eye during life, the existence of a posterior staphyloma may be expected only when the myopia amounts to at least 10 D., —that is to say in a small percentage of cases." Again, on p. 403: "Every conus is, then, congenital, although in the eyes of adults who have been affected with myopia for years it may have become much larger than at birth. The conus, so small at first as to be scarcely distinguishable from a ring of normal connective tissue, increases in size with the eye." "The crescentic conus is, thus, an agenesis of the optic nerve in consequence of an imperfect development of the choroid, manifest in the malformation of that

membrane at the lateral border of the choroidal canal." This view, that conus is a congenital anomaly, explains its existence in emmetropic and hyperopic as well as in myopic eyes. The quality of refraction is of course the result of the length of the optic axis, which in most cases of conus is great enough to cause myopia, but the localized extension of the ocular tunics entitled to be called staphyloma posticum is found chiefly in M. greater than 10 D., occasionally in M. between 6 D. and 10 D., and never in M. less than 6 D. Staphyloma posticum is generally characterized by "an attendant malformation of the sclera, shown by an absence or rudimentary development of its outer layers in the vicinity of the optic nerve, with resulting anomalous insertion of the dural sheath, and consequent abnormal size and shape of the intervaginal space," p. 408. One other statement is worth quoting on p. 411 : "The primarily emmetropic or hypermetropic eye is in no danger of becoming affected with retino-choroiditis of the macula in consequence of acquired myopia. Only eyes with posterior staphyloma resulting from congenital malformation have, in addition to excessive myopia, an especial predisposition to that grave disorder."

The conclusions of Professor Schnabel seem convincing, and he points out that Professor Ed. Jaeger in 1861 maintained that conus, as he first designated it, was a congenital anomaly, whereas Graefe described the condition as sclerotico-choroiditis posterior, at whatever stage it might be seen. With the light thus given us, we shall be less warranted in adopting antiphlogistic measures against advancing myopia, and confirmed in adhering to the hygienic rules which clinical experience has justified in prophylaxis and treatment.

Diseases of the retina are handled by Professor Schöbel of Prague, pp. 413 to 577, under thirty-one sections, and these pages merit careful study. Unable from lack of space to attempt any reproduction of them, we beg to refer to the elaborate and admirable discussion of detachment of the retina (pp. 533 to 552). Of the chapter on diseases of the optic nerve (Professor Deyl of Prague) in forty-nine pages, twenty-one pages are given to choked disk, and only five to optic-nerve atrophy. He ascribes choked disk chiefly to the effect of pressure on the emergent central vein from œdema of the nerve tissue or its sheath, not considering the theory of Leber in favor of the influence of penetrating phlogogenic substances sufficiently substantiated. The latest article on

this mooted question by Krückman (*Graefe's Archives*, Bd. xlv., Obth. 3, p. 497) supports Leber's theory, and yet furnishes the most positive illustration in favor of the pressure theory, because the case described was one of tumor of the nerve situated at the passage of the vessels through its sheath.

Mr. Priestley Smith presents glaucoma in his clear and forcible way, maintaining his well-known opinions. He advises iridectomy in simple chronic glaucoma. To quote: "My own experience, especially since I have adopted the addition of a scleral puncture (see p. 680), is in favor of operating so long as the eye retains any sight worth saving," p. 674. We are persuaded that scleral puncture is in some cases a useful adjunct to iridectomy, but experienced operators will confirm these remarks: "Positive improvement of vision is seldom to be hoped for; the most that iridectomy can do is to prevent further loss. Even this is not obtainable in every case. The operation sometimes fails to arrest the cause of the disease, and occasionally induces a painful aggravation with rapid loss of whatever sight remains," p. 674. His remarks on "malignant glaucoma," pp. 679–681, are very pertinent.

The article on wounds and injuries, by Dr. Grüning, is a good epitome of a wide subject. We have space to quote only this sentence on an important question: "In all cases in which the foreign body is still in the globe our treatment should be guided by the cardinal principle of preserving as long as possible, first, the function of the eye; second, its form; and of deferring enucleation until we are obliged to remove the globe on account of progressive inflammation or danger of sympathetic ophthalmia. In case the foreign body is encapsulated or fixed in the coats of the eye, its presence may cause absolutely no reaction." The discussion of sympathetic ophthalmia, by Dr. Randolph, is largely theoretical, but he covers the subject of treatment in a very discriminating way.

The concluding section upon operations is by Dr. Knapp, who in one hundred and sixty-two pages gives the methods which are to a great extent the result of his own very wide and successful experience. The preliminary observations are eminently judicious; the operation for cataract is succinctly handled, and at the same time takes in a great number of details respecting indications, method, mistakes, reactive processes, treatment, and results. On this topic his instructions deserve and will receive

the most respectful consideration. To successfully make a small iridectomy for optical purposes, a simpler instrument than Mathieu's forceps (p. 786) is Tyrrell's blunt hook, of which a figure is given. If after engaging the pupillary margin it be turned flatwise, there is no danger of wounding the capsule as it is withdrawn. It is an old instrument, suited especially to cases without iritic adhesions, and deserves to be remembered. Brief judgments are passed upon certain operative procedures, as for example upon tenotomy for muscular asthenopia (p. 881), upon Mules's operation, so-called insertion of an artificial vitreous, p. 894, which reflect, we think, the best opinion of the time. Dr. Knapp discusses treatment of lachrymal troubles, which are also the subject of a paper by Dr. Theobald. He does not go beyond the size No. 6 Bowman's scale in probing lachrymal strictures, wherein he is at issue with Dr. Theobald. On page 916 he expresses an opinion regarding orbital sarcoma, which as he says has no capsule, which confirms the judgment of Dr. Bull (p. 49) that "the results of the extirpation of orbital sarcoma are utterly unfavorable." Of course the question of diagnosis is supreme, but no precise symptoms which might determine our decision can be perfectly formulated. What is said by Dr. Bull on pages 33 and 46 is of value.

What is said by Dr. Knapp in operations for empyema of the neighboring sinuses of the orbit, pp. 925 to 930, will be read with much satisfaction; he includes recent literature with his own experience.

In conclusion it may be said that the present volume is a most valuable contribution to literature, and that it should be in the hands of every ophthalmic practitioner. The typographical dress is entirely satisfactory, and but few errors in proof-reading have been noted. H. D. N.

ELECTIONS AND APPOINTMENTS.

At the Denver meeting of the American Medical Association, Dr. CASEY A. WOOD, of Chicago, was elected Chairman, and Dr. C. H. WILLIAMS, of Boston, Secretary of the Ophthalmological Section.

Dr. ALVIN A. HUBBELL has been appointed Clinical Professor of Ophthalmology and Otology in the University of Buffalo. For fifteen years he has occupied the chair of Ophthalmology in Niagara University, whose medical faculty has recently united with that of the University of Buffalo.

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In asking for continued support of the ARCHIVES from subscribers and contributors, the Editors offer no new program, but point to the record of the work that has been accomplished during the past twenty-eight years. At the first appearance of the ARCHIVES in 1869, they constituted the only periodical of their class in America, and had only a few predecessors in Europe. The international character of the ARCHIVES was a novel and distinctive feature.

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Since that date, the ARCHIVES have developed into an extensive and conveniently arranged storehouse of knowledge for the instruction of the student and for reference by the practitioner and the investigator.

For more than ten years, the valuable material offered to the ARCHIVES has been so abundant that it has not been practicable to utilize for the English edition the full series of papers from the German, or the converse. Many articles had to be abridged, while of others abstracts only could be printed. Any one of our readers could, however, have secured, and can secure in future, from the American editor, or the German publisher, the loan of the original papers presenting the complete text.

It is the purpose of the editors to arrange, in the department of Reports, for the review of every publication which in their opinion contains material that can be called distinctive and important. It is, of course, impossible, within the limits of the ARCHIVES or of any similar journal, to give attention to every publication in their department of science. We may state further that it is not a part of our program to furnish a complete report on the *bibliography*, but only on the **progress** of ophthalmology and otology.

Though the systematic arrangement of the reviews is of importance for reference and comprehensive information, we shall publish, as early after the meetings as practicable, reports of the proceedings of societies, always bearing in mind that the ARCHIVES are not intended to be only a repertory of knowledge, but also a journal of news.

It is natural that the English edition of the ARCHIVES should give the advantage of time and space to Anglo-American contributors over the German, and *vice versa*. It is evident, however, that the association of the two editions lends strength to each, furnishing to the authors a wider circulation for their papers, and to the readers a larger and more diversified field of information.

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Dr. P. SILEX, Lecturer at the University of Berlin.

1. *Uveal Tract*, including glaucoma.
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In order to obtain complete and recent reviews on the non-German ophthalmological literature, special reporters have been selected for different countries, who will send monthly abstracts of all local ophthalmological publications to Dr. C. Horstmann, of Berlin, the editor of the Report. Dr. Horstmann will distribute these abstracts among the German reporters according to the above plan, in order to preserve the systematic arrangement which we think of paramount importance.

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In the interest of our readers, who are scattered over the whole world—and whom, like ourselves, we desire to keep informed of all advances in ophthalmology,—furthermore in their own interest, authors of ophthalmological works are requested to send reprints, duplicates of journals, or copies for reviewing, to one of the above-named reporters, or to the editors or publishers of the Archives, according to their convenience.

The abstracts of American ophthalmological literature formerly appeared under a special head, but are now embodied in the systematic Report. Text-books may be specially noticed.

The number of good papers offered us for publication has increased to such an extent that it is no longer possible to translate all of them unabridged. Whenever a German paper is condensed in the English version, or *vice versa*, it will be so stated. Should any one of our readers wish to recur to the original, the editors will always take pleasure in sending it for reference.

Under the heading of "Miscellaneous Notes," there will be published all kinds of professional news which specially concern the oculist, *e. g.*, appointments, honors, resignations, vacancies, new ophthalmic hospitals, opportunities for instruction, prize questions and essays, announcement of Society meetings, etc. Brief notices of this kind will be thankfully received by the editors.

Original papers of value from any source will, as heretofore, be welcome to the ARCHIVES, and are solicited.

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